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PRICE 20 CENTS TABLE OF CONTENTS PAGE 39 AUGUST 12, 1948

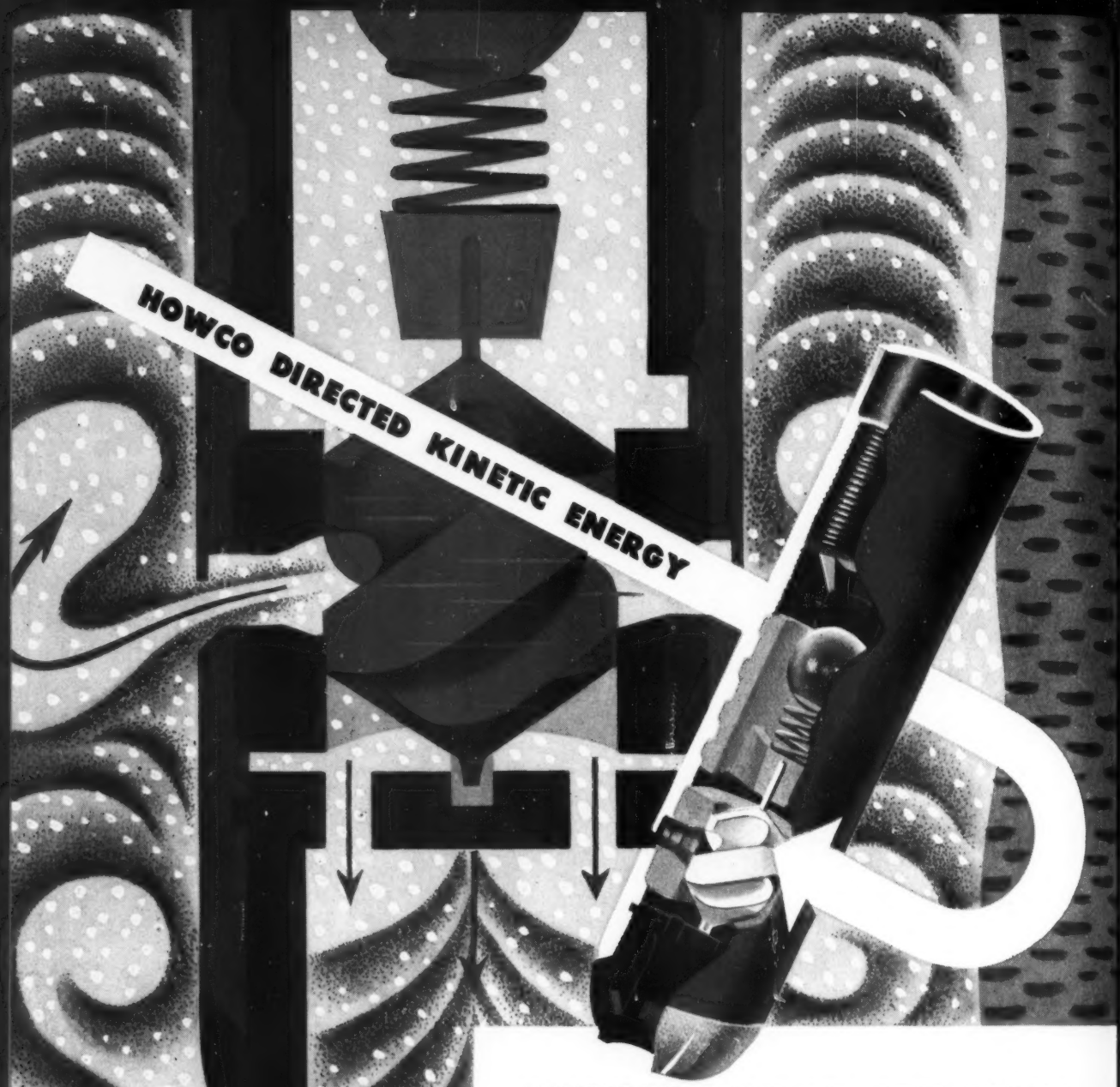

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Table of Contents

NEWS DEVELOPMENTS

Congress Quits Without Hearing Oil-Control Plans 42
Seizure Threat Relaxed as Services Get Oil 42
Texas' Refinery Closing Conforms to Trend 43
Cement Shortage Hampers Drilling 44
Oil Export Quotas Are Higher in Third Quarter 44
Steel Export Leaks Claimed to Be Plugged 44
Compact Commission Plans Heavy Schedule for Meeting 46
Pemex Claims Discovery of Oil Near Rio Grande 47
Venezuelan Crude Output Reached New Peak in June 47
Standard-Vacuum Builds Tankers for Far East 47
Geology of Ethiopia Being Developed by Sinclair 48
Agreements Completed to Allocate Steel for Oil Production 52
California Court Asked to Order Paloma Field Unitization 52
ERP May Break World Oil Market, Official Warns 53
Texas Research Committee Preparing Program 53
ECA Regulations Aimed at Oil Price Premiums 57
Four Oil Companies Ask Offshore Permits 57

Editorial 41
This Week 45
International News 47
Watching Washington 54
Refining News 110
Pipe-Line News 122
Natural-Gas News 127
Statistics and Trends 152

ENGINEERING AND OPERATING

Concrete Pipe Used for Surface Casing in Two Tests 66
Steps in Evaluating an Oil Property 68
Book Reviews 75-89
Flexible Operation Achieved Through Instruments 76
Jet Casing Cutter Saves Hours in California Demonstration 85
Hypersorption Process Provides Precise Control 90
Circular Salt-Water Treating Unit Proves Successful 102
Progress in Metals 104
Engineering Fundamentals—Producing Gas-Oil-Ratio Equation 113
The Refiner's Notebook—Pressure Drops—300° F. 115

EXPLORATION AND DRILLING

Benedum Prospects in West Texas Not Too Promising 135
Highlights of Week's Developments 135
Reports by Areas Start on Page 137
Weekly Well-Completion Record 152
Daily Average Production for Week 153

ADDITIONAL FEATURES

Personals 58
Deaths in the Industry 64
Drilling Contractors 129
Market Summary 154
Equipment Men in News 155
Classified Advertising 156
Events on Calendar 160
Index to Advertisers 160

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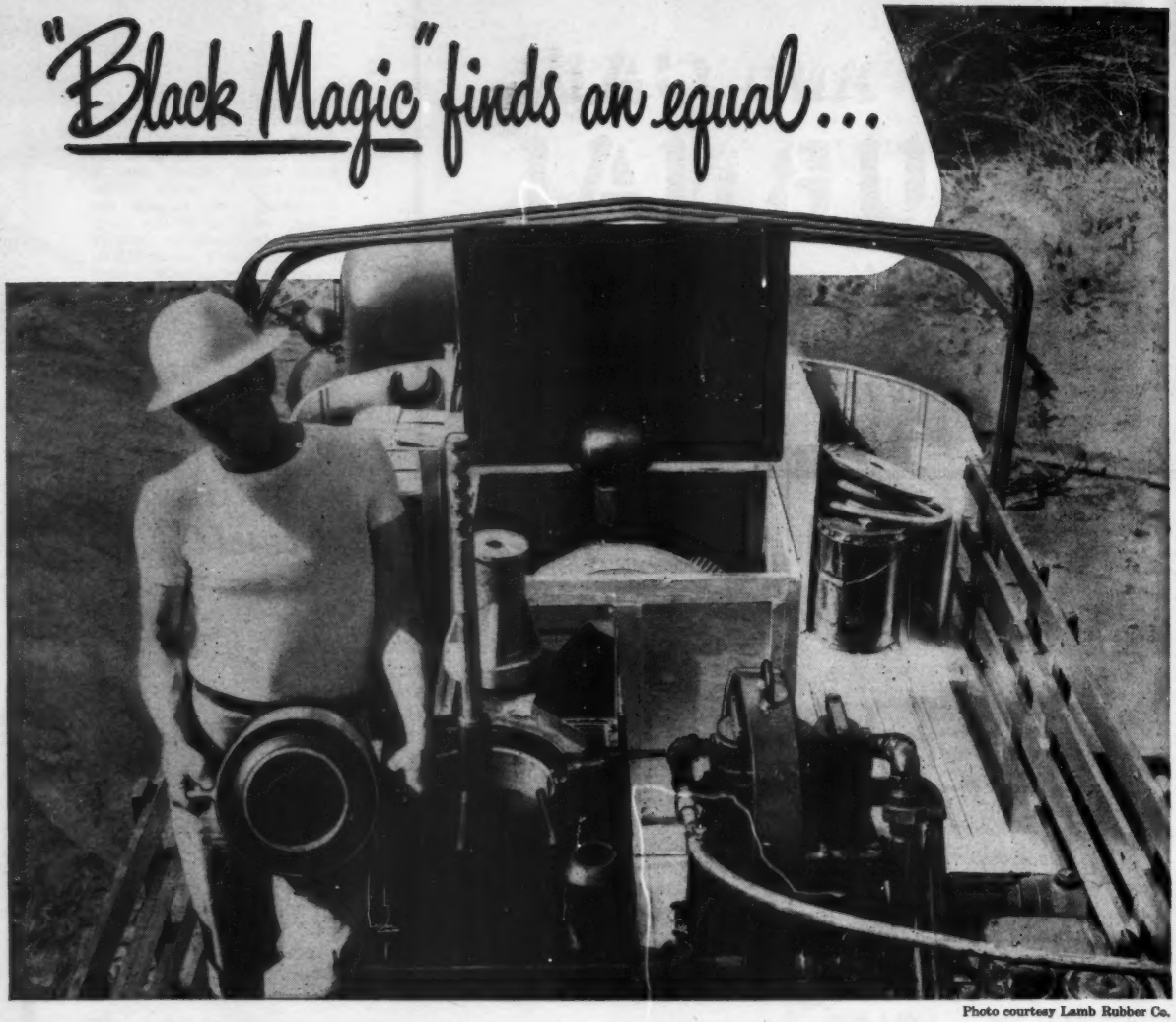

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Expansion Costs

ATLANTIC REFINING'S Colley in a 6-month report last week explained to stockholders the "why" and "how" of 1948 earnings. The company's net returns, in common with the experience of most large and small concerns, are substantially greater than they were in 1947.

The veteran head of one of the country's oldest integrated companies pointed out that to keep pace with demands, operators must invest $4,700,000 daily for oil wells, pipe lines, shops, refineries, and marketing facilities. A 3 per cent factor in the country's total business, the industry is accounting for 10 per cent of the total capital expenditures. "It could not expand during the war," said Colley. "It must now make up for lost time."

Emphasizing that the industry requires high earnings in order to provide the funds for expansion, Atlantic's executive head said: "If the oil industry's units could have floated as much as one-tenth of all the common and preferred stocks issued last year by all the businesses of the country, there would have been available only about one-fifteenth part of the new money actually spent for expansion and a much smaller fraction of the money needed for that purpose. This year's expenditures of new money will be even greater—of the order of 2 billion dollars, or nearly twice as much as the market value of all of the new stock issues sold last year to the public by all industry."

As to where the bulk of the higher earnings is going, the Journal's Midyear Report of July 29 gives the answer. The 300 major and semimajor expansion programs listed for refineries and natural-gasoline, cycling, and petrochemical plants represent new investments comparable to a 10-year period previous to the war. A total of more than 38,000 miles of pipe line are projects required to catch up with transportation needs. The 139 million feet of hole that will be drilled this year exceeds the earth's circumference at the equator.

Equally outstanding are tens of millions that are being spent to expand research and development so that these facilities will not be approached in magnitude by those of any other industry.

All this explains why there have been no serious shortages in supply, although total demands are half again as large as they were prewar. Current activity also guarantees that future demands, regardless of changes in supply, will be met.

As to costs, they range from 50 to 300 per cent greater than they were in 1941. If you question that statement, ask those who are paying the bills. Today's earnings, which are largely financing present growth, have to be coordinated with these costs, which are the base on which future net revenue will be determined.

Congress Quits Without Hearing President's Oil-Control Plan

by Bertram F. Linz

WASHINGTON. — Legislation to impose federal controls on the oil industry were jettisoned, along with most of the rest of the administration's antiinflation program, when Congress adjourned its short special session August 7.

Two relatively minor measures to tighten bank credit and impose curbs on installment selling were the only parts of the program enacted, though executive officials were prepared with a list of other measures to give Government power to regulate prices and distribution of petroleum and other basic commodities.

President Truman lashed out at the refusal of Republican congressional leaders to enact his antiinflation program and declared that in the absence of controls on fuel it will be impossible to avert another crisis in the East next winter.

So strongly did the President feel that he read a formal statement at a press conference, permitting direct quotation, attacking the House banking committee for its failure to approve price and materials controls and the House ways and means committee for not acting on his proposal for an excess profits tax.

Mr. Truman dwelt mainly on his control program, declaring that the Secretaries of Agriculture, Commerce, and Interior "were and are now prepared to testify" on the need for action.

Oil Plan Was Ready

"The Secretary of the Interior was prepared to submit a program dealing with the proper distribution and prices of coal, heating oils, and other fuels," he said.

"The committee of the House refused to receive the views of these members of my Cabinet. In the absence of such basic information I do not see how the committee can make an intelligent decision on issues which so gravely affect the welfare of the American people and their standard of living."

The President's blast was no surprise at the Capitol, where Republican leaders have consistently taken the view that his calling of the midsummer session and renewal of his fight for controls were political gestures designed to make high costs and shortages major issues in the coming campaign.

Congressional policy-makers refused to consider his antiinflation program, declaring it would serve only to hamstring business and industry and would not provide additional supplies of scarce goods which, they say, is the only remedy for the present situation.

Meanwhile Secretary of Commerce Charles Sawyer told the Senate banking and currency committee that voluntary agreements under Public Law 395 are not adequate and should be supplemented by "additional powers."

Sawyer appeared before the committee to support the President's price and materials control program already scuttled by the Republican majority, and his testimony was important only as emphasizing the administration's lack of interest in the voluntary allocation agreements which are being developed by the oil and steel industries.

More Controls Wanted

He told the committee that while the voluntary program has been effective in the case of steel, it is not practical in cases where the number of producers involved is large, where the effort is to reduce the consumption of a scarce material, or where there are many consumers.

Given the mandatory powers sought by the President, however, he said, operations under the voluntary agreement program "could be much more extensive than they now are."

"The mere existence of the mandatory powers would be an inducement to industry to enter into and live up to voluntary agreements," he said.

Sawyer strongly defended the export control program which, in the case of oil, he said, has closely followed the changes in the supply situation.

Without explaining that congressional criticism had been a strong factor, Sawyer said that "since there were severe local shortages of heating oils during the winter, export quotas were sharply reduced during the first quarter of 1948."

With the easing of demand for heating oils in the spring months, export quotas were increased for all products in the second quarter, but were kept substantially below exports for the corresponding period in 1947.

Since demand for petroleum is continuing to rise, Sawyer said, the department has adopted a "very cautious policy" in setting quotas.

However, he commented, gasoline supply this summer has been adequate to meet the sharply increased demands and, barring unforeseen developments, it is not expected that there will be any shortage of heating oils next winter. Nevertheless, he said, until the domestic supply situation is materially improved, it is of the utmost importance to maintain control of petroleum exports.

The major purpose of Sawyer's discussion of exports, it developed, was to support his suggestion that the export control authority, now scheduled to expire next February 28, be extended until at least June 30, 1950.

Seizure Threat Relaxed As Services Get Oil

WASHINGTON.—Offers of products needed by the military have increased to such an extent since the July meeting of the National Petroleum Council that defense officials will not, in the immediate future at least, carry out their threat to invoke the industry-draft provisions of the new Selective Service Act which would permit them to order the industry to provide the products needed under threat of plant seizure.

The more satisfactory situation which now prevails despite a further increase of 500,000 bbl. in requirements for aviation gasoline was divulged by Col. Louis G. Cotulla, new executive officer of the Armed Services Petroleum Purchasing Agency. Cotulla succeeded Comdr. C. G. Dresher this month, when the latter was assigned to the Harvard Graduate School of Business Administration.

Top military officers attending last month's meeting of the NPC told the industry flatly that if it didn't make a better showing in meeting military requirements they would clamp down on it to the full extent authorized by the draft law. Under that law, they could place orders with the companies, to be filled ahead of any other orders, government or civilian, with negotiation of price to come after, rather than before delivery.

In the event a contractor fails to fill such an order, the President is empowered to seize his plant for government operation and, if the contractor willfully refused to give precedence to such orders or failed to meet requirements as to time of delivery or specifications he could be prosecuted and sentenced to fines of as much as $50,000 and up to 3 years imprisonment.

Oil company executives present at the meeting immediately announced they would take steps to see that all military requirements were met.

Texas' Refinery Closing Conforms To Trend in Products Pipe Lines

by Dahl M. Duff

HOUSTON.—Refining operations are scheduled to be discontinued about October 1 at the 27,500-bbl. daily capacity plant of The Texas Co. at Galena Park near Houston.

A brief company statement last week confirmed reports that have circulated here for several weeks. The announcement, authorized by the New York office of the company and issued in Houston, said only that the company was "contemplating closing down refinery operations at its Houston Works on approximately October 1" and that "the plant will be maintained for some time as a crude-oil terminal."

No further comment was forthcoming from company officials but the decision to close the plant conforms to a trend among the nation's larger refining companies by which smaller and less economic units have been discontinued in areas which can be served by products pipe line.

The Galena Park refinery is one of the oldest refining properties on the Gulf Coast. It was acquired in 1928 by The Texas Co. from Galena-Signal Oil Co. of Texas. It is a skimming plant only, and its runs in June averaged 23,042 bbl. daily.

Galena Park is adjacent to Houston, and the refinery property fronts of the Houston Ship Channel. It includes a substantial amount of storage as well as barge and tanker loading facilities. The company did not indicate if the processing facilities will be scrapped or salvaged, but much of the equipment at Galena Park is considered obsolete by modern refining standards.

Pipe Line Can Supply

Last spring The Texas Co.'s pipeline affiliate, Texas Pipe Line Co., and Magnolia Petroleum Co. completed a products pipe line from the Beaumont-Port Arthur area to the Dallas-Fort Worth area with a branch from Hearne to San Antonio. This line is owned by Magnolia from Beaumont-Port Arthur to Hearne, and by Texas Pipe Line Co. the remaining distance. It includes a bleedoff point which can supply the Houston market of the companies.

The Galena Park refinery of The Texas Co. has been operating on sour crude oil from the West Texas-New Mexico area. Texas Pipe Line is a partner in the Jal, N. M.-Cushing, Okla., crude-oil line now completed and operating as far as Wichita Falls, Tex. West Texas and New Mexico crude moves at present from Wichita Falls by tank car mostly north to such refining centers as those operated by Texaco at Lockport and Lawrenceville, Ill.

The Texas Co. also has been expanding its principal Gulf Coast refinery, the 135,000-bbl. daily capacity plant at Port Arthur. Crude-oil lines into the plant are being expanded, and late in July Texas Pipe Line let a contract for a 16-in. line from West Columbia to East Houston where it will tie into a new 20-in. line to Port Arthur and Port Neches. These lines will supplement and in some instances replace inadequate existing lines of the company.

June runs of the Port Arthur refinery of The Texas Co. were 141,790 bbl. daily. The plant has a cracking capacity rated at 170,000 bbl. daily, and presumably has been drawing charging stock from the Houston Works as well as from the 40,000-bbl. daily capacity plant which the company operates at Port Neches. The Port Neches plant is a skimming plant with runs of 38,577 bbl. daily in June. It also manufactures asphalt.

Since the end of the war several other major companies have closed smaller refineries, concentrating operations in their larger properties. Standard Oil Co. (Ind.) discontinued two Midwestern plants; Sinclair Refining Co. closed its Fort Worth plant with indications three other small refineries along the route of its new products pipe line ultimately may be discontinued. Humble Oil & Refining Co. abandoned its Ingleside refinery near Corpus Christi.

Between 150 and 200 persons are employed at the Houston Works of The Texas Co. The company is expected to absorb many of these into other operations, and it is considered possible some of them may be shifted to the 42,000-bbl. capacity plant which the company has under construction at Eagle Point, near Philadelphia.

Virginia Oil Region Getting Active Play

WASHINGTON.—Production of some 67,000 bbl. of high-grade crude oil in the Lea County, Virginia, oil field last year, with an even greater volume indicated for 1948, has led to intensive exploratory activity in Wythe, Pulaski, Giles, Smyth, Montgomery and Tazewell counties.

Wells are being drilled by California Oil Co. on leases in Giles and Tazewell counties, and the company is reported to have taken extensive leases in Montgomery County. Potential oil lands have been leased by the Ohio Oil Co. in Giles County, where another company also is said to be surveying the prospects.

I. Groskins, Tulsa independent operator, reportedly has leased 10,000 acres in Pulaski County, 15,000 in Wythe County, and 7,000 in Smyth County.

The Houston Works at Galena Park which The Texas Co. will close

Cement Shortage Hampers Drilling With Small Chance of Relief Soon

AN acute shortage of cement is hampering drilling operations along the Gulf Coast as well as in other active areas throughout the United States.

No substantial relief is expected until favorable weather this fall and winter slows down the present peak level of operations, not only in the oil industry but in general construction activity.

Operators and drilling contractors in some cases have been forced to canvass small cement suppliers to obtain sufficient material to carry on operations. A representative of a major cementing company reported last week there was practically no available cement at any supply point on the Gulf Coast.

Although cement is particularly short in the Houston area, similar conditions are reported elsewhere, and one drilling well in West Texas was forced to circulate some 48 hours waiting on a supply of cement.

Basic cause of the shortage is the greatly increased rate of general construction work which requires tremendous quantities of cement. The record-breaking drilling program under way in the oil industry itself has brought a stepped-up need for cement which mills are unable to fill completely when coupled with construction requirements.

An agent of a Belgian cement manufacturer visited the Houston area recently and took orders for large quantities of cement at delivered prices several times those of the domestic product. Cement also has been shipped out of Pennsylvania to Texas at delivered prices ranging from 50 to 150 per cent above those at which cement could be bought locally were it available. Cement also has been going into the Rocky Mountain area at a reported price of about $5 a sack, including freight.

Can't Plan Ahead

A cementing company official explained that the requirements for cement for use in drilling are so variable that it is not possible ordinarily to contract for the product in the same way as construction companies. A builder of a dam or a road, for example, can anticipate his total needs well in advance and contract for supplies. A considerable quantity of cement is moving to government construction work which often carries a priority.

To meet the situation, some cement mills have adopted an allocation system. Despite this, a belief that cement may take on a "gray-market" status in some areas before the arrival of cold weather has been expressed by responsible oil-industry officials.

Higher prices as well as a shortage have come to the cement market. A large part of the recently increased price results from the Supreme Court's decision several months ago outlawing the basing-point system used by the cement industry, and as a result, cement mills no longer absorb freight to outlying markets.

Some additional cement production capacity is in sight. Erle P. Halliburton, of Halliburton Oil Well Cementing Co., is building a plant at Corpus Christi which will produce about 16,000 sacks daily and is expected to be in operation in about a year. In Houston, Gulf Portland Cement Co. is preparing to put new facilities in operation, increasing production 40 per cent, and Trinity Portland Cement Co. has under way a program to increase its output about 25 per cent.

The cement mills themselves are piling up unfilled orders, and one mill official said his plant is 60 days behind on orders and that no new customers had been accepted for more than a year.

Gas Flaring Prohibited In Texas' Fullerton Field

AUSTIN. — The Texas Railroad Commission has warned operators in Fullerton field, Andrews County, West Texas, against flaring of casinghead gas from wells in the field.

In a letter to operators, the commission said production will not be permitted from wells which are not connected to the natural-gasoline plant operated by Phillips Petroleum Co. and serving the field.

The commission said its decision was based on the ruling in last year's Seeligson field case in which the Texas Supreme Court upheld the commission's general authority to enforce casing-head gas conservation. Wells not connected, it said, will be shut in or their allowables reduced. This applies to the Clear Fork as well as other pay zones in the field.

A recent order of the commission set the basic allowable of 40-acre wells in the field at 66 bbl. daily. This was designed to hold casinghead production to about 70,000,000 cu. ft. daily, the capacity of the processing plant. (The Oil and Gas Journaly, July 8, page 43).

Oil Export Quotas Are Higher in Third Quarter

AN export quota of 14,575,000 bbl. of crude oil and refined products for the current quarter was announced by the Office of International Trade August 10. The third-quarter quota is 626,000 bbl. above the allocations for the second quarter as announced by OIT May 6.

With the exception of kerosine, the quota for which was left unchanged at 500,000 bbl., and motor gasoline, which was reduced 120,000 bbl. from 5,020,000 to 4,900,000, increases were provided for all categories.

The quota for crude oil was increased from 1,871,000 to 2,220,000 bbl., and that for residual fuel oil from 1,263,000 to 1,450,000 bbl. "to meet the essential requirements of several countries," OIT explained.

A 317,000-bbl. increase in the quota for gas oil and distillate fuel oil, from 3,883,000 to 4,200,000 bbl., the agency said, was necessitated by the requirements of additional distillate in Caribbean refineries for the production of special fuel oil for the Navy.

The quota for aviation gasoline was increased 43,000 bbl., from 1,262,000 to 1,305,000 bbl., to meet the needs of Gander airport in Newfoundland, for which supplies can be delivered by tankers only during the summer months.

Steel Export Leaks Claimed to Be Plugged

WASHINGTON. — Department of Commerce export statistics are being closely watched by the House small business committee to determine whether loopholes which made possible the wholesale forging of export licenses have been definitely plugged.

A spokesman for the committee charged last month that actual exports of steel in the first quarter of this year were 203 per cent of the amount covered by export quotas set by the Office of International Trade.

Paul O. Peters, staff investigator, attributed the heavy excess exportation to the forging of and trafficking in export licenses, which were disclosed by congressional investigations last spring.

Peters said the first quarter steel quota was 735,085 short tons, but actual exports were 1,495,000 tons. Retained in this country, he said, the excess steel could have gone far toward easing the difficulties of the oil industry and other consumers.

Figures on second-quarter exports have not yet been compiled.

this week

CONTROLS—Congress adjourns without even debating administration's proposals for controls on basic industries. . . . ¶President Truman denounces Congress. . . . Says Interior Department was ready with program to regulate prices and allocation of petroleum. . . . ¶Commerce Department says voluntary allocation program futile. . . . Wants power for mandatory controls. . . .

EXPORTS—European recovery program could wreck the petroleum trade of the world unless closely patrolled, official warns. . . . Foreign countries' oil buying must be held to program or it will cause high prices and short supplies here. . . . ¶New ECA regulations seek to control prices of oil bought for Europe. . . . ¶Leaks in steel export controls and bootlegging of licenses stopped by new regulations. . . . ¶Oil export quotas for third quarter are increased slightly. . . .

MATERIALS— Acute shortage of cement hampers oil-well drilling in many areas. . . . Premium prices being obtained and "gray market" condition feared. . . . ¶Government officials clear steel-allocation programs designed to provide minimum oil-industry requirements for lease production and barges. . . . Similar programs for pipe and tubular goods termed useless. . . . ¶Ethyl Corp. raises price of antiknock compound 7 1/2 per cent effective October 16. . . . Cites higher cost of lead and labor. . . .

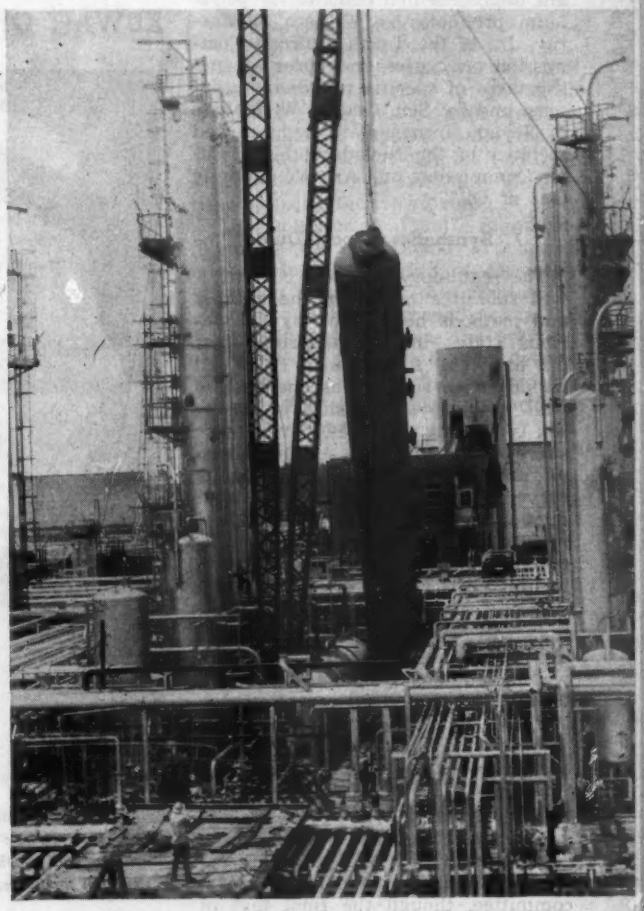
PRODUCTION—Compact Commission plans governors' forum on state programs to increase production and maintain supplies. . . . New York meeting will hear important technical committee reports. . . . ¶State-supported production research program being drafted in Texas. . . . ¶California court asked to order compulsory unitization of condensate field. . . . ¶Several oil companies reveal plans for further development work offshore in Gulf of Mexico. . . .

TRENDS—Three new all-time highs were recorded for the industry for week ended August 7. . . . ¶Crude production reached 5,503,730 bbl. daily average. . . . An increase of 9,280 bbl. over previous record high for week ended June 26. . . . ¶New high for all well completions totaled 835. . . . Compares to previous record of 822 for week ended July 17. . . . ¶Wildcat-completions record for week ended August 7 totals 145. . . . Previous record was 144 for week ended July 24. . . . ¶Four states set new production records for the year in week ended August 7. . . . Illinois, 179,300 bbl. . . . Indiana, 23,900 bbl. . . . Louisiana, 482,850 bbl. . . . New Mexico, 132,960 bbl. . . .

INTERNATIONAL—Sinclair making extensive geological reconnaissance of its Ethiopian concession. . . . Not yet ready for geophysical or drilling work. . . . ¶Pemex claims important oil discovery near Reynosa. . . . First in northern Mexico. . . . ¶Venezuelan crude production reaches new all-time high in June. . . . ¶Standard-Vacuum building tankers for Far East trade. . . .

PIPE LINES—Contracts for 580 miles of looping let by Stanolind Oil & Gas Co. for its main trunk-line system. . . . Construction to start immediately. . . . Completion scheduled before end of year. . . . ¶Argentine's 1,100-mile natural-gas line progresses. . . . ¶Trunkline Gas Supply Co. plans to shorten proposed line and reduce diameter. . . .

REFINING—The Texas Co. will close old Houston refinery, supplying area from new products line. . . . Action conforms to current trend in industry. . . . ¶Cosden Petroleum Corp. to change its Big Spring, Tex., plant from thermal to fluid catalytic cracking unit. . . .



This unusual job of placing a very heavy load with utmost care was performed by the regular maintenance crew of the Tutwiler refinery of Cities Service Refining Corp. at Lake Charles, La. The 85-ft. mercaptan absorber was hoisted over surrounding piping and lowered to its foundation with split-hair precision. With but a fraction of an inch between the vessel and operating equipment, the job was completed without damage of any sort and on a stop-watch schedule which kept downtime to a minimum. Placing the derrick was an equally exacting task

Compact Commission Plans Heavy Schedule for New York Meeting

IMPORTANT committee reports and discussion by a panel of state governors on the responsibility and actions of states in securing an adequate supply of petroleum will mark the quarterly meeting of the Interstate Oil Compact Commission in New York August 30 to September 1.

Gov. Thomas E. Dewey of the host state will address the meeting on the subject of interstate cooperation, and the governors of half a dozen other member states will take part in a forum led by Gov. Beauford H. Jester of Texas, compact chairman, on state programs for oil regulation. This will be designed particularly to interest states of the Northeast.

Other scheduled addresses will be by Gov. Frank Carlson of Kansas on cooperative action in interstate oil and gas fields, by Chairman Ernest O. Thompson of the Texas Railroad Commission on how the compact has made it possible to supply the present unprecedented demand for petroleum products, by William J. Murray, Jr., of the Texas Railroad Commission on causes and cures of spot shortages of specific petroleum products, and by Sen. George W. Malone of Nevada, former state engineer and member of the Nevada Public Service Commission, on "Are We Running Out of Oil?"

Synthetics Report Due

The regulatory practices committee will submit a report on the manner and methods being used by the various states in administering their oil and gas regulations. This will include such subjects as checking of well spacing, supervision of casing set, cementing practices, temperature surveys, deepening, gas-oil and water-oil ratio tests, bottom-hole pressure surveys, plugging, checking of production reports, methods of determining allowables, restrictions on discovery allowables, and rules relating to unitization.

A nation-wide survey of synthetic fuels will be reported by the research and coordinating committee, which will include an inventory of raw materials such as natural gas, oil shales, and coal. The study will include information on the amount of research and pilot installations in various states and data on federal activities and legislation.

A progress report on drafting a comprehensive oil and gas conservation law will be made by the legal committee, though the final text of the proposed model statute is not expected to be completed until late in the year.

There will also be a progress report by the stripper well committee which is making a survey of stripper areas in conjunction with the National Stripper Well Association and the Independent Petroleum Association of America to determine the quantity of oil that may be recovered by proper primary and secondary production methods.

Humble Creates Office For Offshore Operations

HOUSTON.—The trend toward separate district or division organizations to handle offshore drilling work in the Gulf of Mexico was emphasized last week when Humble Oil & Refining Co. announced creation of a district office in Freeport to supervise Texas offshore operations.

Superintendent of the new Freeport district, which will function under the Gulf Coast division, is D. C. Rhodes, formerly district superintendent at North Katy. Other supervisory personnel of the new district include E. E. Byrd, district petroleum engineer formerly in the same capacity at Tomball; D. J. Lewis, district civil engineer, formerly senior civil engineer in the Gulf Coast division office in Houston; and R. L. Smith, district chief clerk formerly in the same capacity at Friendswood.

Humble is preparing to undertake several operations off the Texas Coast. Thus far, one drilling platform has been completed in the new district at a location about 10 miles southeast of Freeport and 6 miles from shore. Humble already has extensive offshore operations in Louisiana under its Grand Isle district organization.

Phillips Petroleum Co. recently announced creation of an offshore division to be headed by V. P. Ethridge, formerly Gulf Coast division superintendent. Earlier, Stanolind Oil & Gas Co., another active operator in the Gulf Coast, organized a marine drilling office in charge of T. E. Boyce, former Navy admiral.

KUWAIT OFFICIAL INSPECTS MAGNETOMETER

R. D. Wyckoff, chief of the geophysical division of Gulf Research & Development Co., shows an airborne magnetometer to Izaat Jaafar, aide-de-camp to the Sheik of Kuwait, who was one of the company's guests at a demonstration of this petroleum exploration instrument for newspaper men and petroleum officials over Westchester County, New York, last week (Acme photo)

International

WORLD-WIDE OIL DEVELOPMENTS

Pemex Claims Discovery Of Oil Near Rio Grande

THE first oil production in northern Mexico was announced this week by Petroleos Mexicanos which has completed two wells 5 miles south of Reynosa near the Rio Grande.

The wells found two pay zones in the Cretaceous formation locally known as Fria. At 1,450 meters (4,470 ft.) the oil tested 60° A.P.I. gravity, and at 2,150 meters (6,640 ft.) it tested 50°. The shallower pay zone has a thickness of 37 ft. Three gas formations were located between the two oil zones.

No oil is said to have been produced from this formation where it has been found north of the Rio Grande in Texas. Pemex officials are elated with their discovery, which was made entirely with their own geologists and drillers. The wells are now being gaged for production and plans are under way for additional drilling in the area.

Venezuelan Crude Output Reached New Peak in June

PRODUCTION of crude petroleum in Venezuela set a new record of 1,338,248 bbl. per day in June. Western Venezuela averaged 957,394 bbl. and Eastern Venezuela 380,854 bbl. daily.

In March Western Venezuela produced 941,411 bbl. daily and Eastern Venezuela 375,064 bbl. daily, for a total average of 1,314,475 bbl. daily.

Leading Western fields were Lagunillas, with an average output of 346,898 bbl. daily in June; Tia Juana, with 180,491 bbl.; Bachaquero, with 115,535 bbl.; La Paz, with 116,386; and the relatively new Mara field with 39,091 bbl.

Among Eastern fields attracting greatest current attention, Quiriquire produced an average of 67,705 bbl. daily in June, Oficina averaged 41,752 bbl., Las Mercedes averaged 5,254, and Nipa averaged 21,867 bbl. daily.

Creole Petroleum Corp., largest producer in Venezuela, also established another new high record with a June output of 650,753 bbl. daily, which is 6,620 bbl. higher than its May production.

Of the 650,753 bbl. daily output, 487,194 bbl. were from the Lake Maracaibo area; 159,324 bbl. from Eastern Venezuela; and the remaining 4,235 bbl. were from Cumarebo.

Creole's refinery runs were also increased during June, with a total of 85,830 bbl. daily. This compares with 57,651 bbl. daily for May. Of the 85,830 total, 66,148 bbl. of crude oil were refined at Caripito and 19,682 bbl. at La Salina.

Thirteen wildcat and development wells were completed by Creole in June with 12 of them oil producers and the other a dry hole. Fields where the producers were brought in, their average initial production and average depth follow:

Development—Bolivar Coastal (B. C.F.) 9 wells, 581 bbl., 4,875 ft., and Quiriquire 2 wells, 452 bbls. 3,732 ft. The dry hole was completed in the Temblador field at 4,100 ft.

Wildcats—Bolviar Coastal (B.C.F.) 1 well, 832 bbl., 5,247 ft., and Roble, 1 well 157 bbl., 10,644 ft.

Mene Grande Negotiating For Orinoco Concession

Negotiations are under way involving the purchase of Orinoco Oil Co. by Mene Grande Oil Co. (Gulf Oil Corp.), according to reports from Venezuela. The Orinoco properties consist principally of a large concession west of Lake Maracaibo between La Paz and Mara fields. Exploratory work has been carried on for several years and the company has a production of approximately 300 bbl. daily from Netick field. Pure Oil Co. owns 75 per cent of the stock of the Orinoco company.

Italian Lube Trade Freed

As of July 1 all restrictions were removed on the trade in lubricating oils throughout Italy, according to the Italian Minister of Industry and Commerce.

Standard-Vacuum Builds Tankers for Far East

WITHIN the next 2 years Standard-Vacuum Oil Co. will augment its tanker fleet by four vessels with a combined capacity of more than 500,000 bbl. They are to be chartered for use in the Far East.

These ships are still in the drawing board stage, but W. F. Dunning, manager of marine operations, explained this week that construction will start immediately at the Bethlehem-Sparrows Point shipyards in Maryland.

Each of the four tankers will have an average capacity of 125,000 bbl. with on over-all length of 487 ft. 6 in. and a moulded beam of 68 ft.

Similar in size to the wartime T-2 type vessels, the new tankers will be powered by geared high-pressure steam turbines capable of developing 7,700 shaft horsepower, and will be designed to do a minimum of 15½ knots during their trial runs.

In announcing that Standard-Vacuum had contracted to charter the boats for a period of 15 years, Dunning stated that this addition to the company's tanker facilities in the Orient should help ease the pressure on presently available tankers needed for crude oil and product movements in the Western Hemisphere and to European ports. The necessity for providing additional tonnage for growing Far Eastern market requirements is already urgent, he said.

Iran Crude Output High During First Half of Year

Iranian crude-oil production of Anglo-Iranian Oil Co., Ltd., during June dropped to 2,041,000 tons, or approximately 510,225 bbl. daily, compared with an all-time high output in May of 2,228,000 tons, or about 539,000 bbl. daily.

The company's total Iranian production for the first 6 months of this year was 11,476,000 tons, or 475,500 bbl. daily, compared with 9,399,000 tons, or 400,000 bbl. daily, for the same period in 1947.

Geology of Ethiopia Being Developed By Sinclair in Exploring Concession

by Hall Taylor

SINCLAIR PETROLEUM CO. geologists, before entering Ethiopia in August 1947, had become familiar, through study of the rather scanty literature, with the general geology of the area.

It was known, for instance, that the mountainous Ethiopian massive, which embraces almost the entire northwestern half of the country, consists of volcanic peaks which tower above thick Cenozoic lava flows. Underlying these lavas, as revealed in the walls of gorges cut by mountain streams, are hundreds of feet of Triassic and Jurassic sedimentary strata. But such beds, covered as they are by hundreds and even thousands of feet of lava, and exposed only in scattered localities, do not offer promising prospects in an oil search, and have not been studied.

Similarly, the Abyssinian graben, which follows a northeast-southwest course across the central part of the country and is the second major physiographic division, consists largely of lava flows covering faulted blocks of the earth's crust. Sedimentary strata reportedly appear at the surface in a few parts of this graben; but the trough, which is part of the great East African Rift Valley system, contains many hot springs, fumaroles and even recent lava flows; and these, coupled with the abundant faulting, make it appear unpromising as a potential source of petroleum. Native reports of scattered oil seeps in the region have never been verified by experienced geologists.

International

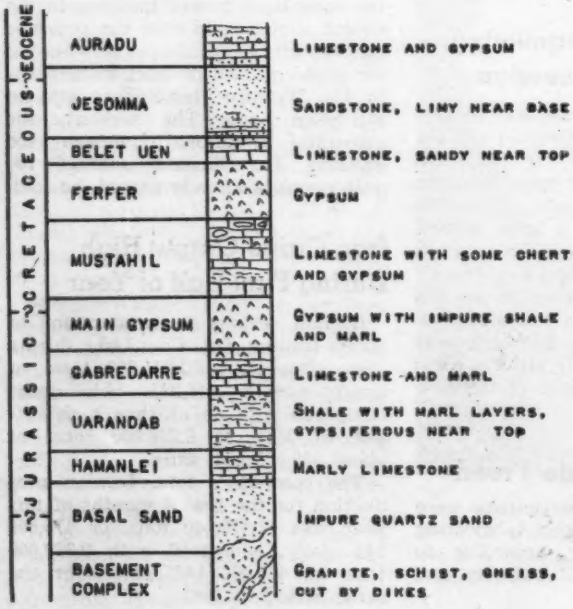
This is the second of two articles on Ethiopia by Hall Taylor, assistant professor of geology at Columbia University, who has just returned from a leave of absence during which he served as stratigrapher of the field party exploring the Ethiopian concession of Sinclair Petroleum Co.

The first article dealt generally with the nature of the country, principal geographical features, and difficulties of transportation and communication. In this article the author describes the geology of Ethiopia, which heretofore has been relatively unknown.

On the other hand, the third major physiographic division of the country, the Somali plateau, contains a sedimentary section of sands, limestones, shales, and gypsiferous layers which is at least several thousand feet thick, and thus merits close geological study. This plateau lies in the southeastern portion of Ethiopia. It begins at the edge of the Abyssinian graben where its upraised surface is 6,000 to 8,000 ft. high, and slopes gradually southeast toward the Ogaden, a very gently rolling, sand and brush-covered desert only 1,000 to 2,000 ft. in elevation, lying in the heart of eastern Africa.

A Sinclair geological party began study of this area in August 1947, moving into the Ogaden and establishing a base camp 4 miles east of Wardere, Somali tribal village and headquarters of a British district commissioner who administers several thousand square miles of the surrounding territory, and who governs the native nomadic tribes, in accordance with a British policy to which the Ethiopian government has subscribed.

The geological party included W. G. Serra, camp manager and geologist who had spent many years in Africa, and who spoke the native Swahili language, as well as English, French, and Italian; Jim Kisling and A. B. Rowley, consulting geologists of Tulsa, Okla., and their assistants, Paul Adams and John Harvey, recent graduates of Kansas University; John Lock, chief geologist; Hall Taylor of Columbia University, stratigrapher and (during Lock's illness)



Left: Generalized stratigraphic column of the Ogaden, southeastern Ethiopia

Right: Aerial view of the town of Dire Dawa, with Sinclair's warehouse in foreground. Narrow-gage railroad from Djibouti passes through center of picture. Hills on skyline are faulted edge of Abyssinian graben

International

Eocene limestones rimming flat-floored valley in the eastern Ogaden. Such good rock exposures are rare over much of the Ogaden area

chief geologist; Bob Garwick, assistant stratigrapher; Marion Crume, mechanic, carpenter and supervisor; and about 15 native boys who served as helpers.

The first geological work consisted of reconnaissance surveys of the Ogaden, using Jeeps and a Dodge Power Wagon truck to drive out roads and trails in the area. After selection of the most promising place for detailed work, the consultants, Kisling and Rowley, with their assistants, Adams, Harvey and Garwick, began plane tabling and assembling detailed structural and stratigraphic information. Meanwhile, Serra, Taylor, and Lock continued regional stratigraphic and structural studies, making extended trips through the country.

Water is Scarce

On such safaris it was customary to be away from camp for 7 to 12 days, and to cover up to 1,200 miles. A Dodge Power Wagon, equipped with extra gasoline tanks and carrying in addition two 55-gal. drums of gasoline plus necessary food, water, tools, cooking, and camping equipment, served admirably as a reconnaissance vehicle. Everything, even including water needed for the trip, was carried from the main camp, since there are no sources of supply in that desert country.

By such travel, aided by limited detailed work in critical areas, much information was assembled. This, combined with information gathered by geologists of Azienda Generale Italiana Petroli, an Italian state-controlled oil company that explored the area before World War II and that, through its chief geologist, Carlo Migliorini of Florence, Italy, made its findings available to the Sinclair company, led to formation of a good regional geologic picture.

The entire area apparently is the remnant of what in middle and upper Mesozoic time was a great basin of deposition that received first basal sands, then alternating marine sediments, evaporites, and sands. Regional dips today are to the south and east.

Pre-Mesozoic rocks of the basement complex lie at the ground surface near the uplifted edge of the Somali plateau southeast of the Abyssinian graben. Good exposures appear along the road between Dire Dawa and Harrar where pink coarse-grained granites are cut by numerous aplite, pegmatite, and even lamprophyre dikes. Intermixed with the granites are schists and gneisses.

Overlying these crystalline rocks, and derived apparently from their erosion, is a basal sandstone, probably Liassic in age, and varying in thickness from nothing on the crests of uplifted granite blocks to more than 500 ft. in some areas northwest of Harrar.

A sand similar to this, and overlying basement crystallines, is widespread in eastern Africa, and ranges in age from about middle Triassic to middle Jurassic. In the area north of Ethiopia it is known as the Adigrat sandstone.

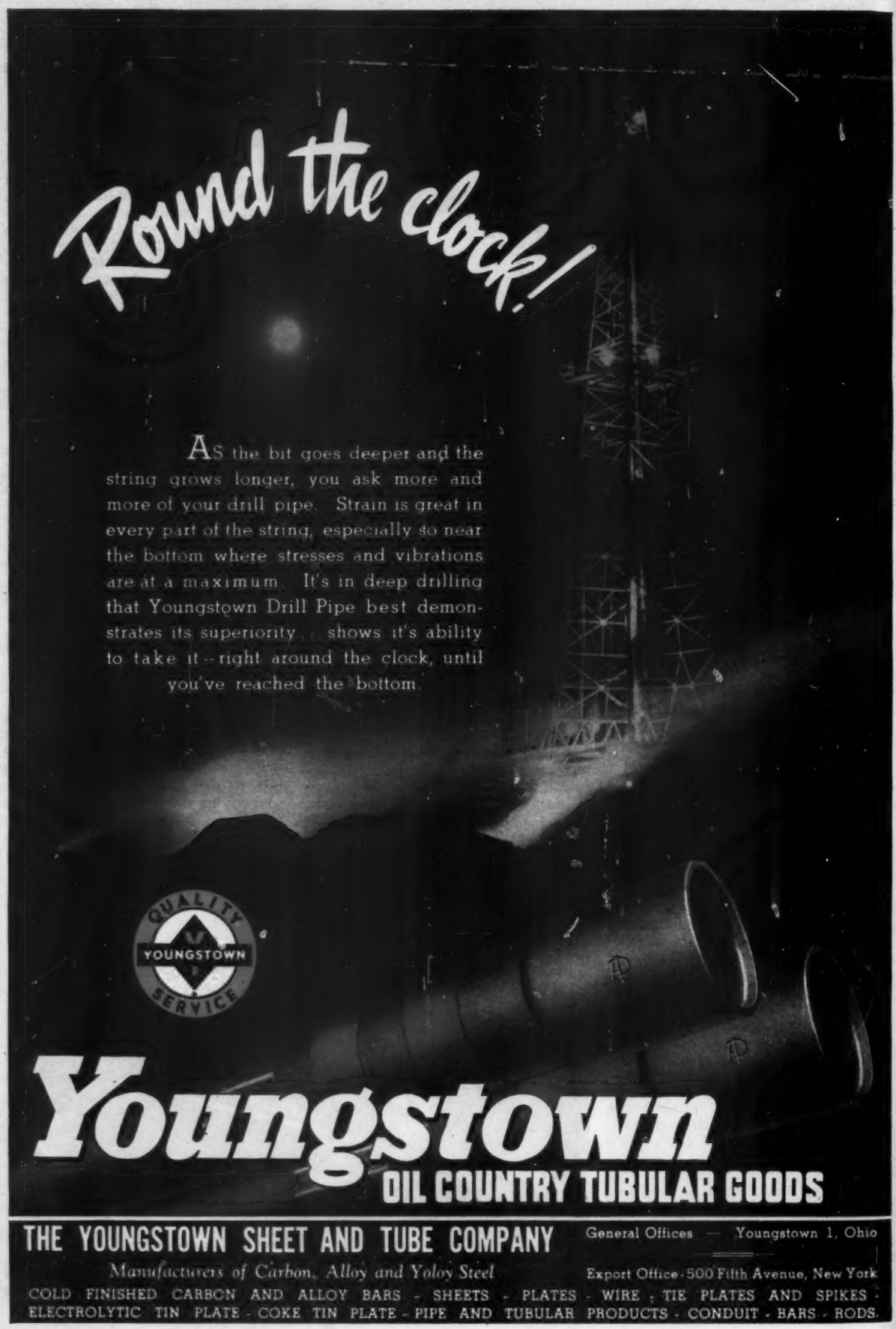
If, as seems likely, this sand is derived from early Mesozoic erosion of exposed granitic areas, and if the Ogaden was a region of deposition in middle and late Mesozoic times, it is probable that this formation attains a thickness of many hundreds of feet in the subsurface section of southeastern Ethiopia. It might be a good reservoir rock just as are some of the arkosic and conglomeratic layers overlying buried structural features in the American Mid-Continent region today.

Italian Names Used

To the southeast of the exposures of this basal sand there crop out several limestone, shale, gypsum, and sand layers of Jurassic and Cretaceous age. Italian geologists who worked in the region prior to World War II named these formations after Ogaden villages or districts, and also described them in their field notes. For convenience, the Italian-applied names are retained in the descriptions given below, though it is recognized that they do not at the present time have valid standing in the literature. Furthermore, there appear to be lensing and facies variations within the formations themselves, making predictions of subsurface lithologies hazardous. No deep wells have been drilled in the area, and subsurface data are not available.

Overlying the basal sandstone is the

Refueling Sinclair's four-passenger Stinson plane on the brush-free strip of sand which served as the Wardere, Ogaden, airport. Gasoline was trucked in from Hargeisa about 200 miles to the north in British Somaliland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Hamanlei (pronounced ham-an-lay') formation, a nodular fossiliferous marly limestone of Malm (upper Jurassic) age, which is quite shaly in its lower part. At outcrops in the northwestern Ogaden it appears to be more than 300 ft. thick.

Above the Hamanlei is the Uarandab (war-an-dab') formation, primarily of shale but with many intercalated marly layers. Near the base there are several rather pure thin limestones, and near the top the shale becomes somewhat gypsiferous. Belemnites are very abundant fossils at several horizons. The formation is at least 500 ft. thick at the surface, and might be a source bed for oil in the subsurface.

Overlying the Uarandab is the upper Jurassic Gabredarre (gab'-reh-da'-reh) formation of alternating marly and pure limestones, with some of the latter beds being oolitic. It is the uppermost of the definitely Jurassic (Malm) formations. Near the top there appear a few gypsiferous and sandy layers—forerunners of the gypsum which is so abundant in the overlying formation. Total thickness exceeds 400 ft.

Fossils Lacking

Future detailed study will probably indicate that the three Jurassic "formations" just described are actually worthy of separation into a number of additional units. Certainly there are definite lithologic and perhaps even depositional breaks within the "formations" as described. They correlate with the Kimmeridgian and Portlandian of the European section.

Above the upper Gabredarre beds of Portlandian age are several hundred feet of strata which are primarily gypsiferous, but also contain some shaly and marly facies. Because of lack of fossils their exact age is unknown. These beds overlie the Portlandian and underlie Barremian strata of the lower Cretaceous. Evidently they represent a time of extreme desiccation which occurred in this portion of Africa at about the Jurasso-Cretaceous boundary.

Overlying these gypsiferous strata is the Mustahil (moose-ta-heel') limestone, lowermost formation of definitely Cretaceous age. Its 700 or more feet of strata include beds of Barremian, Aptian, Albian and lower Cenomanian age. In its lower portion the formation is a rather pure fossiliferous limestone except for a few intercalated marly layers; in the middle portion there is some gypsum; and near the top a number of cherty layers appear.

Outcrops Are Rare

Another thick gypsum section, called the Ferfer (fair-fair), lies above the Mustahil limestone. It is unfossiliferous but lies between Cenomanian limestones, and thus its age is established.

Above the Ferfer gypsum is the Belet Uen (bel'-eh-tu-wain') formation containing 200 or more feet of rather pure fossiliferous limestones, chiefly Cenomanian in age, which grade upward into sandy beds that contain Turonian fossils. The transition into the overlying sands is gradual, but at the level where sand rather than lime predominates in the section the Belet Uen formation is considered to end, and the overlying Jesomma (ee-yay-zom'-ah) sandstone, likewise of Turonian age, to begin.

This Jesomma sandstone, which is at least several hundred feet thick, is the source of most of the surface sand in the Ogaden. Outcrops, except along some of the tugs, notably the Fafan, are rare, desert weathering through the ages having replaced bare rock with low rolling, sandy, brush-covered hills. In exposures the sandstone exhibits considerable cross-bedding, and structural deductions based on measurement of local dips are unreliable. Individual grains are rounded to sub-angular and moderately to heavily frosted. Weathered surfaces commonly show a dark brown to black clinkery crust of laterite, which may appear igneous in character. The sandstone is non-fossiliferous, and the upper portion may belong in the lower Eocene, but it seems more likely the sand represents a period of erosion which separated the Cretaceous and Eocene in this portion of Africa.

Drilling Not Yet Started

Above this Jesomma sandstone, in the eastern part of the Ogaden, there are Eocene limestones which appear to be part of the Auradu (aw-raa'-doo) series of eastern British Somaliland. In the Ogaden these strata are chiefly soft, fossiliferous limestones, but to the northward, near the British Somaliland border, they interfinger with extensive gypsum beds, and to the east they grade into gypsiferous strata. Evidently the early Eocene was another period of desiccation in eastern Africa.

Examination of the preceding stratigraphic descriptions shows that the sedimentary sequence of the Somali plateau in southeastern Ethiopia includes at the surface several thousand feet of limestones, shales, sandstones and gypsiferous layers. Since drilling has not yet been undertaken in the area the subsurface section is unknown. However, the strata dip to the southeast, reflecting the presence of a basin of deposition during the upper Mesozoic. Under such conditions it is likely the formations will retain their over-all surface thicknesses, and may even add to them in the subsurface. Furthermore, since the surface strata include both potential source beds and reservoir rocks the area warrants careful search for possible petroleum reserves.

Sinclair's warehouse and equipment at Dire Dawa, Ethiopia

Agreements Completed to Allocate Steel for Oil Production, Barges

WASHINGTON.—Voluntary agreements for the allocation of 16,530 tons of steel products a month for tank and oil-field production equipment and 20,000 tons for construction of domestic barges and towing vessels were discussed in public hearings before the Office of Industry Cooperation August 4 and 5.

No opposition whatever was offered to either program, although there were suggestions that the volume of steel covered by each could well be increased and, in the case of the lease-operations equipment, comment that the allocation might prove inadequate to meet the needs of the oil industry.

With these two agreements sent on their way for final approval, Clifford A. Hahn, head of the OIC petroleum division, moved to set up an advisory committee for pumps, derricks, and other production equipment.

Another agreement, covering steel plates for tankers, has been delayed by the inability to secure definite figures on projected operations from ship builders.

In the drafting of the final version of the two agreements, provision was made for their continued operation after next February 28 in the event Congress extends the life of Public Law 395, as has been recommended by the steel-industry advisory committee.

Meets Oil "Bogey"

At the same time, it was disclosed that the Attorney General has rendered an opinion that agreements perfected before the February 28 deadline may continue to run for a period of 6 months thereafter. This disposed of a question whether the agreements would automatically terminate at the end of next February, cutting very short the effective period of the oil-industry steel allocations and others that may be perfected from now on.

Explaining the equipment - steel agreement, Hahn introduced a new word to define the objective of the oil industry's production program, declaring it was designed to cover the requirements of the industry to meet the "bogey" for petroleum production from this year through 1950 —6,250,000 bbl. daily this year, 6,550,000 daily in 1949, and 6,800,000 daily in 1950.

But Max W. Ball, director of the Oil and Gas Division, warned that demand is continuing to rise at an unprecedented rate and said that today any estimate of requirements through 1950 would be higher than that made last February.

Spokesmen for the equipment producers who discussed the agreement explained that they have now absorbed all surplus government tanks offered through the War Assets Administration and have exhausted their warehouse stocks, and now have no excess materials usable for their purposes.

The agreement was given the approval of Russell B. Brown of the Independent Petroleum Association of America, who served as chairman of the National Petroleum Council committee which drafted estimates of the industry's steel needs, but, he said, while this is a real contribution toward providing for one important segment of the industry's steel needs, requirements for other categories of equipment also must be met if the needed oil is to be produced, refined, and distributed.

The barge program was sponsored by the Office of Defense Transportation, which is handling all transportation - equipment agreements made under the law.

R. L. Glenn, director of the division of manpower and materials, told the meeting that inadequate supplies of line pipe make the barge program imperative, while in addition the expansion of coastal petroleum fields will require the enlargement of the oil-barge supply since those fields can be served only by water-transportation facilities.

Representatives of the barge and towing industries who testified at the hearing urged that the steel allocations be increased to care for repair and maintenance operations as well as new construction.

Figures released last week by the American Iron and Steel Institute disclosed that shipments of steel pipe and tubes totaled 3,302,748 tons during the first 6 months of this year, an increase of 10.7 per cent over the record shipments of the first half of 1947.

Continuance of this high rate of shipments during the remainder of 1948 would result in a new annual record beating the 1947 total of 6,117,884 tons.

Two Companies Ask California Court To Order Paloma Field Unitization

LOS ANGELES.—A suit to force unit operation of Paloma field, 35 miles southwest of Bakersfield, was filed in Superior Court of Kern County August 2 by Western Gulf Oil Co. and The Texas Co.

For several years part of the field has been operated under a unit plan by these two companies and Ohio Oil Co., General Petroleum Corp., Union Oil Co., and Barnsdall Oil Co., returning residue gas to the formation to maintain high underground pressures.

Principal defendants are Superior Oil Co., Pacific Western Oil Corp., Lloyd Corp., Chansler Canfield Midway Oil Co., and Hancock Oil Co., which are charged with withdrawing gas from other parts of the field and selling it, making impracticable continuance of pressure-maintenance.

The complaint states that Paloma is a condensate field in which a large part of the liquids contained in the formation is in gaseous form due to the high prevailing pressures, and alleges that unless high pressures are maintained enormous quantities of these liquids now in gaseous form will be condensed within the reservoir and be forever lost to the royalty owners and the consuming public. This potential loss is estimated at 61,000,000 bbl. of oil valued at $166,000,000.

The principal defendants, it is explained, were invited to join the unitization agreement but declined, and recently Richfield Oil Corp. has drilled one producing well and is drilling others with the intention of not returning gas to the reservoir.

The quantity of recoverable gas now in the reservoir, according to the plaintiffs, exceeds one trillion cubic feet and the recoverable oil and other liquids exceeds 220,000,000 bbl., all of which would be recovered if the field were operated as a unit and the gas returned to the formation until all liquids are produced.

The court is asked to determine the most equitable and effective method of operating so as to protect waste and adjust the correlative rights of the interested parties, and to enjoin the production of any oil or gas from the field except in conformity with the court's decree.

Upwards of 100 royalty owners in Paloma field are also named as defendants but are not charged with wasteful practices.

ERP Will Break World Oil Market Unless Watched, Official Warns

WASHINGTON.—Failing determined but diplomatic action by the Economic Cooperation Administration and a constant surveillance of the buying activities of the Marshall-plan countries, the European recovery program may lead to a runaway oil market, it was indicated last week by Walter Levy, director of petroleum for ECA.

Levy sounded his warning before the National Petroleum Council meeting in an appeal to the industry to help him find experienced, qualified oil men to take top jobs in his division, now without any staff whatever.

In a statement later released by NPC Chairman Walter S. Hallanan, Levy pointed out that petroleum products, oil transportation, and oil equipment will account for one-fifth of the $5,000,000,000 program for the first year of ECA operation, making it imperative that this segment of the procurement program be handled with the utmost efficiency.

The original request of the Marshall-plan countries for the current year called for about 1,200,000 bbl. daily of oil imports, which has been cut to between 900,000 and 950,000 bbl., of which about 95,000 bbl. daily will be furnished from the United States, he said.

Endangers Supply

For the first quarter of its operation, ECA commitments for dollar oil ran about $106,000,000 for approximately 300,000 bbl. daily, but for the current quarter it is expected they will run to $150,000,000 for approximately 400,000 bbl. daily.

"It is basically important for us as well as for you that we should not allow the countries to buy oil in line with a program which cannot be met, which would create disturbances here and everywhere else," Levy declared. "Otherwise, our activities might contribute to inflation here and would interfere dangerously with our sources of supply."

Levy explained that under Section 202 of the ECA appropriations act, the delivered price for supplies to ECA countries should not be higher than the price of supplies delivered from the United States. Because of this and other limitations which have not yet been satisfactorily interpreted, he said, payments for $20,000,000 are outstanding.

Dealing specifically with the situation in the oil industry, Levy pointed out that there have been premiums on tanker transportation over the Maritime Commission rate, as well as premiums on oil, which are causing headaches in ECA circles.

"Are we entitled to pay premiums for crude oil which certain countries can purchase only if they agree to pay premiums?" he asked. "What would happen if tomorrow after we have granted a premium on crude oil the premium is incorporated in the price and a new set of premiums are built up on top of the new price? What would happen if, in order to make it possible for an ECA country to get, say, 2,000 bbl. of crude oil a day, ECA would contribute to a 50-cent rise in the crude-oil price for 5,500,000 bbl. daily in the United States?

"Another problem is this: What is a pricing basis which is a fair and adequate one for refined products, which ECA, with its overriding responsibility to see to it that the United States taxpayers' money is spent as wisely as possible, can really justify? We are no OPA. We are not interested in profits. However, we have the responsibility to spend the money wisely and, therefore, the question of oil prices is involved.

"If, for instance, certain offshore supplies are sold at a high price, is ECA, irrespective of profit considerations, entitled to spend your money and my money for such supplies?"

Even if ECA is careful in its financing and does not allow any premiums on crude, he continued, the country concerned may turn around and use its own dollars.

Every country, in addition to ECA assistance, has some dollar income, he explained. If it uses such dollars indiscriminately and drives the price up, it may make it impossible for a domestic refiner to obtain the crude or finished products he needs because these supplies are going to ECA countries instead.

Texas Petroleum Research Committee Preparing State-Supported Program

HOUSTON.—The Texas Petroleum Research Committee, which is preparing to launch a state-supported program designed to increase primary and secondary recovery of oil, is now in the process of setting up its organization.

The committee, headed by W. J. Murray, Jr., member of the Texas Railroad Commission, as chairman, has announced that suggestions for appropriate additional research projects will be welcomed.

Qualifications for research engineers to carry out and supervise the programs at the University of Texas and Texas A. & M. College have been outlined, and the committee is asking that persons interested contact either the committee office at the petroleum-engineering department at the university or at A. & M.

Plans for the state research program originated with the Railroad Commission members and have been given the support of Gov. Beauford Jester, himself a former commission member. The two educational institutions have appropriated $50,000 each to carry the work until September 1, 1949, and it is hoped that subsequent financial support will be provided by action of the legislature out of the ⅛-cent-a-barrel tax now levied on Texas oil production for support of state oil regulation and of which only about a third is used *(The Oil and Gas Journal, February 19, page 68).*

The committee is asking the cooperation of the industry in the matter of personnel and the program itself. The announcement of the committee said the group was formed to develop a program of research in petroleum engineering with particular emphasis on problems of secondary recovery of oil, improvement of primary recovery methods, and any other means to increase the total quantity of oil recovered and to be recovered from Texas fields. Specific problems are to be assigned by this committee to the school best prepared to handle such problems, thereby eliminating overlap and duplication of effort. In asking for suggestions of other projects, the committee said several are now being carried out.

Research engineers to supervise the programs at both institutions should, the committee said, preferably have advanced degrees, a general background in petroleum engineering, and a demonstrated ability to initiate and carry on laboratory research, particularly in reservoir engineering. Salaries will be in line with similar positions in industrial research, it added.

Besides Murray, the committee consists of Harold Vance and Albert B. Stevens, of A. & M. petroleum-engineering department, and Harry J. Power and George H. Fancher, of the petroleum-engineering department at the university.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

No Pipe Agreements

WASHINGTON.—Interior and Commerce Department officials, who have been getting along together fine on most of the questions involved in the oil industry's efforts to secure voluntary agreements on the allocation of steel for oil, have fallen out over the latter's refusal to seek agreements covering oil-country goods and line pipe.

Because the anticipated production of oil-country goods is seen as sufficient to meet the domestic requirements of the oil industry during the current fiscal year, the Office of Industry Cooperation has not recommended an agreement in that field.

Conversely, since the requirements for line pipe are almost 5,000,000 tons a year, and the maximum anticipated production is 1,725,000 tons, and the basic steel industry is operating at its maximum rate of production, it is felt no improvement can be obtained through attempting to negotiate a voluntary agreement in that area.

Interior officials, however, say they would feel easier if the steel industry would do formally what it has informally promised it would do to keep the fabricating plants supplied for maximum production. They continue to urge the OIC to reverse its position.

A third class of products for which the OIC is not proposing an agreement is forging and castings, officials saying that present indications are that these products have been and will be available in sufficient supply to meet the existing stated requirements.

Floating Pipe Mills

ANTICIPATING the possibility that government controls on the export of line pipe might interfere with their program, Trans-Arabian Pipe Line Co. officials a year ago worked out plans for production of their own pipe in the Middle East, but were forced to abandon them because of limitations on the export of plate.

The plan called for the acquisition of several surplus carriers, which would be converted into floating pipe mills and stationed at each end of the projected pipe line. The idea had progressed to the point of discussion of the layout with an equipment manufacturer, when it was learned definitely that it would be impossible to secure the steel plate.

Later, as it became apparent that exports of line pipe from this country would be seriously curtailed or halted entirely, as they were some weeks ago, the pipe-line company sent for representatives to scour all the possible foreign steel-producing areas in the hope of procuring new sources of supply but, so far as can be learned, without much success.

Unless the Office of International Trade permits the resumption of pipe exports next month, construction of the line for the Arabian American Oil Co. will come to a stop within a matter of weeks. Company officials, however, are hopeful that export permits will again be granted, since a second plant has recently come into operation for rolling of large-diameter pipe.

Coal Wants a Cut

LEADERS in the coal industry are determined that when synthetic liquid fuel production attains commercial stature they are going to be in on the ground floor as full-time partner with the oil industry and not merely as a supplier of raw material.

With oil and natural gas, aided and abetted by John L. Lewis, apparently destined to cut deeper into existing coal markets year by year once steel again becomes plentiful, the coal industry sees in synthetic oil and gasoline its last opportunity to regain a strong and profitable spot in the fuel picture.

When coal-company executives talk about synthetic fuels they say frankly that possible profits and not altruism is back of their interest in the experimental work now going on.

They point out that when synthetics from coal become a going business, they will still have to compete with natural petroleum, and that competition will depend in part upon the cheapness with which the basic material can be procured.

If the coal industry merely supplies the raw material it will get the pit-head price, with a very narrow profit. If, however, it shares in the synthetic fuel industry it probably can forget about profits on mining and do much better from the profits on liquid fuels.

The most economical production of synthetics will come from plants located over coal deposits, which thus will have no transportation cost on the raw material. The coal companies have those deposits, close to the areas which will consume large volumes of the liquid fuels, and thus are in position to make attractive offers to would-be synthetics manufacturers.

But oil men are perfectly willing to let the coal people dig the stuff and bring it to the surface, counting on their own distribution facilities, marketing know-how, and research on processing techniques to keep them ahead in this game.

Atom Power Distant

DESPITE the great strides that have been made in atomic science and the optimistic predictions that a new source of power is, so to speak, just around the corner, scientists aren't sure that commercial atomic energy plants will ever be a reality.

Since there is only a limited amount of U-235, the one substance naturally capable of sustaining a nuclear chain-reaction, large-scale operation of atomic power plants would depend upon the ability to transfer that power from U-235 to other materials through which it will spread, a process that can be accomplished with plutonium and known as "breeding."

While experiments indicate that breeding is a feasible way of building up stocks of fissionable material, it is estimated that several decades would be required to develop atomic energy, operating on a breeding principle, to the stage where it could effectively replace other sources of power. If breeding proves impossible, the alternative is the extraction of uranium from low-grade ores, for which an economic method has yet to be devised.

If the question of supply cannot be solved, it is doubted whether atomic energy has any useful large-scale future. If it can be solved, the raw materials ought to last sufficiently long to permit the finding of new sources of power before they run out. There is nothing to indicate that atomic energy from presently known materials can be the permanent answer to the problem of power after other fuels are exhausted.

Today, it is estimated that electricity from an atomic generating plant can be produced at a cost comparable with those of electricity generated from coal. Another interesting estimate is that, weight for weight, fissionable material yields nearly 3,000,000 times as much heat as coal.

ECA Regulations Aimed At Oil Price Premiums

WASHINGTON. — Regulations covering prices at which oil and other bulk commodities entering into the European recovery program may be sold to Marshall-plan countries were issued this week by the Economic Cooperation Commission.

Under the ECA appropriations act, no purchases of commodities in bulk may be made with the funds appropriated, at prices higher than the market price prevailing in the United States at the time of purchase, adjusted for differences in cost of transportation to destination, quality, and terms of payment.

The new regulations provide that determination of the adjusted market price is to be made by the administrator, who may make his determination in a manner reflecting commonly accepted trade practices.

On purchases in bulk outside the United States, in which category most of the oil sales involved will fall, the adjusted price may also take into account transportation costs and related charges from the place of purchase to the participating country at established rates.

"If the price of any purchase in bulk exceeds the adjusted market price, the participating country shall pay promptly to the administrator upon demand, the entire amount of the purchase price (or such lesser amount as the administrator may demand)," it is provided.

The new regulations also revise the documentation required, notably in the certificate to be furnished by suppliers of all commodities under ECA programs. The new form will require the supplier to certify on the basis of information available to him that, to the best of his information and belief, the purchase price is no higher than the market price prevailing in the United States, after statutory adjustments.

Texas Dry-Gas Allowables Up Slightly for August

AUSTIN. — The Texas Railroad Commission's allowables for August for dry-gas production from 23 prorated fields total 1,023,663,958 cu. ft. daily. The figure represents an increase of 158,202,582 cu. ft. daily over the total allowables for the 23 fields for July.

The July allowables and to a lesser extent those for August reflect seasonal drops in demand. Largest of the prorated fields from the standpoint of production is Carthage where the August allowable was fixed at 439,832,772 cu. ft. daily, against 394,852,000 cu. ft. daily for July. Second largest is Old Ocean with an August allowable of 208,099,290 cu. ft. daily, against 202,938,000 cu. ft. daily for July.

Other August allowables: North McFadden 21,290,321 cu. ft. daily, Alief 8,709,677, Blue Lake 26,467,742, McCoy 7,580,645, Needville 19,580,645, North Louise 4,751,613, Sublime 7,000,000, La Blance 14,818,355, La Sal Vieja 0, McAllen 13,790,321, Riverside 8,785,483, Rooke 15,330,000, South Weslaco 29,838,708, Carthage 439,832,775, Navarro Crossing 10,790,161, Oakwood 7,304,611, Rodessa 29,564,516, Tri-Cities 28,967,741, Waskom 58,064,514, Whelan 57,903,226, Spies Springs, high pressure, 1,645,161, and Eden 3,548,387.

Ethyl Corp. Increases Price of Antiknock Fluid

An increase in the price of antiknock compound was announced by Ethyl Corp. August 10 to become effective October 16. The increase amounts to 1½ cents per 100 cc. of tetraethyl lead used in the compound and will represent an advance of 7½ per cent in the price of automotive compound and 7 per cent in aviation mix.

In a telegram to customers Ethyl Corp. pointed out that in the past it reduced prices eight times and the only previous increase was a small one last July. It explained that its wage rates have been increased by more than 50 per cent and the price of metallic lead has advanced from 6½ cents to 19½ cents per pound since 1945.

Stanolind Building Two Bases for Offshore Work

HOUSTON.—A 10-acre tract in the East End Flats section of Galveston has been purchased by Stanolind Oil & Gas Co. for use as a supply and service point for the company's projected offshore drilling operations.

Construction work is already under way on another Stanolind shore base for offshore operations. This is at Sabine, Tex., where the company acquired a 20-acre area.

Four Oil Companies Ask Offshore Permits

HOUSTON.—Applications for permits to construct installations in the Gulf of Mexico for seismograph and drilling operations have been filed with the Department of the Army Engineers by four oil companies.

Cities Service Oil Co. proposed seismograph work in the Gulf and other waterways in an area central to a point about 21 miles southwest of Dulac, La. Atlantic Refining Co. asked authorization to conduct seismograph work in the Gulf of Mexico in an area 127 by 35 miles central to a point about 65 miles southeast of Grand Cheniere, La.

Permits for drilling platforms were asked by Humble Oil & Refining Co. and Magnolia Petroleum Co.

Humble proposed platforms and other structures in three areas, one central to a point about 14 miles southwest from Venice, La., in Plaquemines Parish; another central to a point about 17 miles southwest of Buras in Plaquemines Parish; and a third about 37 miles southeast of Dulac in Terrebonne Parish.

Magnolia's requested permit covers an area central to a point about 42½ miles southwest of Morgan City in St. Mary Parish. Tidelands Oil Corp. and Superior Oil Co. asked a permit from the Engineers Office in Galveston, Tex., authorizing a 2-in. water line on the bed of the Gulf to a proposed drilling site in State Tract 483 off Matagorda Peninsula, Texas.

Next Week

The story of the Benton Unit cycling operation in Bossier Parish, Louisiana, will be rounded out in next week's lead article in the Engineering and Operating Section, with a complete description of the plant equipment and processing units themselves. Two previous Journal articles have described other phases of this operation. The article will be liberally illustrated.

The development of a procedure for the preparation of water-base drilling muds for laboratory investigations will be described by three chemists for Phillips Petroleum Co.

How Sinclair Refining Co. developed a system of operating two shell-still batteries which handle all of the 65,000-bbl.-per-day crude-distilling capacity in its Marcus Hook plant is the subject of an article by a Journal staff writer.

The first of several useful engineering shortcuts, presenting nomographic charts and discussions, will be published next week. Also scheduled is another of the popular reports on active fields, this one on Sugar Valley, in Matagorda County, Texas. In addition, among several other features, will be a story on a new visual control system, which analyzes ordinary routine paper records in a visual manner.

PERSONALS

Kantzer Heads Operations For Union in California

BASIL P. KANTZER, who since 1943 has been chief production engineer in the Los Angeles office for Union Oil Co. of California and has been in charge of the company's production engineering and production research programs, has been appointed manager of field operations for California to succeed W. J. Larson, who has resigned.

A native of Salt Lake City and a graduate of Stanford University with a B.S. degree in petroleum engineering, Kantzer began his career in the oil industry in 1934 when he joined Union as a field roustabout. He was soon made a junior engineer at Dominguez and 2 years later became assistant foreman at Santa Maria where he remained for 3 years. In 1942 he became division foreman at Bakersfield.

Kantzer is chairman of the American Petroleum Institute Central Committee on district activities and is a past chairman of the engineering board of the California Conservation Committee.

R. S. Blazer, formerly vice president of Allied Oil Co., Inc., has been named president; **L. M. Jonassen,** former general manager of Cleveland Tankers, Inc., has been named president of that company; and **C. H. Marshall,** former vice president of Central Pipe Line Co., has been named president of Central Pipe. The promotions are a result of the recent merger of Allied Oil and Ashland Oil & Refining Co. The three companies will operate as independent subsidiaries of the newly expanded Ashland Oil. **F. R. Newman,** formerly president of Central Pipe and of Cleveland Tankers, and **W. W. Vandeveer,** formerly president of Allied Oil, will no longer be identified with the operating management, according to the terms of the recent merger.

C. F. Zimmerman, formerly air carrier inspector for the Civil Aeronautics Administration, has been named superintendent of the aviation section of Continental Oil Co.'s motor transportation division with his headquarters in Ponca City, Okla.

Dr. H. Truehart Brown, assistant director in charge of industrial liaison and public relations of the Texas Research Foundation, Dallas, Tex., has been elected chairman of the Dallas-Fort Worth section of the American Chemical Society. Previous to his appointment to the Foundation Dr. Brown had served with Standard Oil Co. (Ind.) and Magnolia Petroleum Co.

C. E. SPAHR

Charles E. Spahr, formerly general assistant to **S. H. Elliott,** vice president of Standard Oil Co. (Ohio), in charge of transportation, has been elected vice president of Sohio Pipe Line Co., a subsidiary of Ohio Standard. Spahr joined Sohio in 1939 and has worked in an engineering capacity on various transportation projects. Prior to joining Sohio he was assistant to the vice president of the engineering department for Phillips Petroleum Co. and was engaged in the economic study of new pipe-line projects. During World War II Spahr supervised the construction of the Chittagong - Tinsukia section of the 3,500-mile emergency fuel pipe line in the India-Burma theater.

N. C. Draper, formerly assistant purchasing-stores representative for Shell Oil Co., Inc.'s Tulsa area, has been assigned to the regional purchasing-stores department in Houston. In his new position, he will have responsibility of handling pipe requirements, coordination of surplus material among the various company areas, and general phases of production purchasing - stores activities. Draper joined Shell in Tulsa in 1928 and since that time has held various positions in the purchasing and stores division.

J. C. Martin, Jr., district geologist for Texas Gulf Producing Co., Houston, has resigned to join the geological staff of Bay Petroleum Corp., Denver, Colo.

C. C. Tate, in charge of Phillips Petroleum Co. activities in connection with the Petroleos Mexicanos project since 1945 in Mexico City, has been promoted to assistant manager of the refining department for Phillips and will be located in the Bartlesville office. His new position includes supervision of the Phillips Oil Co. refineries, Alamo Refining Co., Wasatch Oil Co., Inland Empire Refineries, Inc., and Home Oil & Refining Co. He will continue his supervisory duties of the Pemex project. Two other promotions in the Phillips company include: **J. W. Loy,** manager of the refining department of Wasatch Oil Co. for the past year, has been appointed general superintendent of the Northwest division of the refining department of Phillips. Loy will be in charge of refineries at Woods Cross, Utah; Pocatello, Ohio; Spokane, Wash.; and Great Falls, Mont., owned by Wasatch and its subsidiaries. **G. E. McKenna,** assistant superintendent of the Borger refinery since 1946, has been named superintendent there to succeed R. D. Evans, who died recently. Before joining Phillips in 1936 McKenna served with Humble Oil Co., Penna Petroleum Co., and Great Lakes Pipe Line Co. as a chemist and engineer.

Norman V. Kinsey, Shreveport independent operator, has been appointed Louisiana representative on the Interstate Oil Compact Commission by Gov. Earl K. Long, succeeding **Leland Richardson** of Baton Rouge. Kinsey has been in the oil business since coming to Shreveport 29 years ago as a roughneck. Kinsey served as state conservation agent, minerals division, North Louisiana district, during 1928 and 1929.

William J. Hogan, president of the State bank at Bolivar, N. Y., has been named to the board of directors of South Penn Oil Co. to succeed the late David E. Crawford.

Richard J. Kaul, formerly assistant in charge of chemicals to the manager of New Jersey refineries, has been appointed manager of the operations and planning division of the chemical products department of Esso Standard Oil Co. Prior to his appointment as assistant to the manager of New Jersey refineries in 1947 he had served as superintendent of the chemical products plant at the company's Bay-

way refinery, manufacturing assistant to the general manager of East Coast refineries, general superintendent of the Bayway refinery, and as engineering assistant to the vice president in charge of manufacturing.

A. W. Tarkington, formerly assistant treasurer of Bethlehem Supply Co., Tulsa, has resigned to become treasurer of Continental Oil Co., Ponca City, Okla. Tarkington, prior to joining Bethlehem Supply as credit manager in 1937, was assistant credit manager for the First National Bank of Dallas, Tex. He became assistant treasurer for Bethlehem Supply in 1939.

Serge B. Jurenev, secretary, who had been serving as treasurer temporarily for Continental Oil Co., Ponca City, Okla., has been appointed manager of Continental's coordinating and planning department. He will continue as secretary of the company.

Joe C. Rawlins has been named to succeed **Walter B. Fulton,** chief engineer of Interstate Oil Pipe Line Co., who has retired after 30 years' service with the company.

Fred Sawmiller, field superintendent for Rex Oil & Gas Co., Muskegon, Mich., has been promoted to general superintendent in charge of all operations for the company.

J. A. Doyle, Massachusetts district manager of Esso Standard Oil Co., has been appointed Greater Boston area leader of the Oil Industry Information Committee of Massachusetts to succeed **Charles L. French** of Socony-Vacuum Oil Co., Inc.

James A. Upham, Mt. Vernon, Ohio, has been reelected president of the Ohio Oil and Gas Association and **John E. Morrow,** Pitsburg, Ohio, has been elected vice president and chairman of the executive committee. **Philip N. Faine,** Logan, Ohio, continues as executive secretary. Other members of the executive committee recently elected include: **Marshall B. Belden,** Canton, Ohio; **John E. Bird,** Hanley & Bird, Wooster, Ohio; **C. T. Bole,** Quaker State Oil Refining Corp., Marietta, Ohio; **Rolland Cox,** Rolland Cox Drilling Corp., Wooster; **Peter B. Lilly,** National Gas & Oil Corp., Newark, Ohio; and **Kenneth P. Milliken,** Waverly Oil Works Co., Bremen, Ohio.

Five supervisory employes at Humble Oil & Refining Co.'s Baytown, Tex., refinery have been named assistants to the night superintendent. They are **Ralph A. Baughman, Guy B. Chenault, M. H. Emanuel, J. W. Ferrel,** and **Claude H. Tipton.**

Norman Anderson has been promoted to general superintendent of pipe lines for Richfield Oil Corp., Los Angeles, Calif., and will assume the duties formerly handled by **A. H. P. Gore,** who has retired as manager of the department. **D. F. Purdy** has been promoted to chief engineer for the company and **W. W. Thoburn** has been named northern division superintendent to succeed **Gordon Slater,** recently retired.

David R. Williams, vice president, Williams Brothers companies, and **William G. Heltzel,** consulting engineer, have returned to the United States from a trip to Chile, Argentina, Peru and Bolivia. Last week they conferred in Tulsa with Fernando Reich, pipe line specialist for Corporacion de Fomento, an agency of the government of Chile, and with two commission members of the corporacion — **Eduardo Simian,** chief of operations in Magellan area, and **Luciano Claude,** chief of petroleum division. Williams and Heltzel are preparing a report for the corporacion in New York with Reich regarding the proposed 45-mile, 8-in. Mantantiales-Caleta Clarence, Tierra del Fuego crude oil pipe line.

M. G. Gamble, general manager of the marine department for Standard Oil Co. (N. J.), has been appointed to the International Transport Committee of the Chamber of Commerce of the United States for the year 1948-49. Evans, a member of the Chamber's board of directors, served in a similar committee capacity last year.

E. L. Hinds, core-drill supervisor with a Florida exploration party, has been named division core-drill supervisor at Fort Worth for Stanolind Oil & Gas Co.

Ralph Hubman, Michigan geologist for The Texas Co., has been transferred to the company's Rocky Mountain division office at Denver, Colo. He will be succeeded by **Glenn Ford,** formerly of the company's Salem, Ill., division office.

Harold I. Hoover, superintendent of the East Chicago, Ind., refinery of Phillips Petroleum Co., has been promoted to the newly created position of technical assistant in the products pipe-line division of the supply and transportation department. Hoover, who joined Phillips in 1934, has been succeeded at the East Chicago refinery by **W. E. Staton.** Hoover will make his headquarters at the company's home office in Bartlesville, Okla.

L. C. Davidson, formerly traffic manager of the marketing division for Cities Service Oil Co., has been named traffic manager of the company's refining division to succeed A. C. Holmes who died recently. Davidson has been with Cities Service for 25 years and since 1940 had been traffic manager of the marketing division. **S. P. Kelly,** who joined the company in 1945 at Bartlesville, Okla., has been named assistant traffic manager.

James R. Lewis, a member of the Federal Petroleum Board, the branch of the Oil and Gas Division charged with administering the Connally "Hot Oil" Act has been named chairman to succeed **Ray O. Armstrong,** who has resigned. **Jack Peterson,** who has been examiner in charge of the Kilgore, Tex., office, has been made a member of the board, and **Selman J. Lones,** examiner in charge of the Midland, Tex., office, has been named an alternate member of the board.

A. H. CHAPMAN

Alex H. Chapman, former vice president of Hoover, Curtice & Ruby, has joined Arabian American Oil Co. as assistant to **James Terry Duce,** vice president of Aramco. After leaving Hoover, Curtice & Ruby, Chapman worked as a consultant for Trading & Shipping, Inc. During the war he was chief of the foreign production section of the Petroleum Administration for War and prior to that was superintendent of the Portland Pipe Line Co. Before the war he was production manager of Anglo-American Oil Co., Ltd., a subsidiary of Standard Oil Co. (N. J.)

Three recent additions to the executive staff of Deep Rock Oil Corp. include: **J. G. Campbell,** formerly in transportation and supplies and economics work for Shell Oil Co., Inc., has been named manager, supplies and economics division, for Deep Rock; **A. R. Bell, Jr.,** formerly controller and director of Universal Moulded Products Corp., Bristol, Tenn., will join Deep Rock September 1 as controller; and **J. H. Westbrook,** previously with Booz, Allen & Hamilton, management consulting

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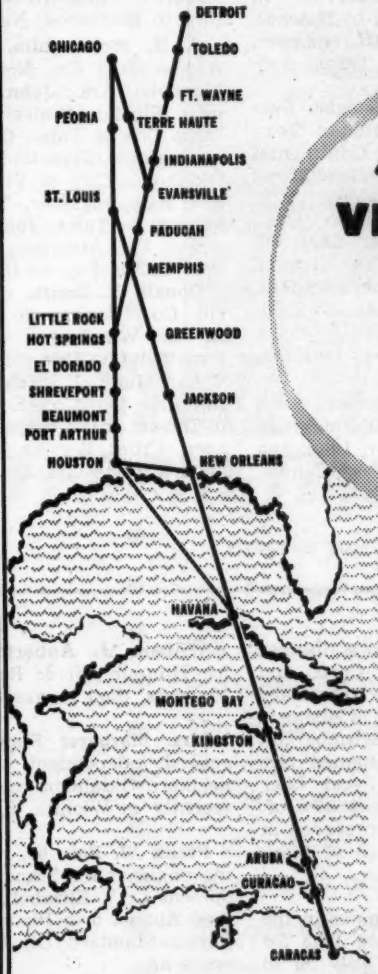

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PERSONALS

firm, becomes manager, personnel and industrial relations division for Deep Rock.

Max Barash, chief counsel of the U. S. Geological Survey, has resigned effective August 30 to enter private practice in Washington. During the past 15 years Barash has participated in drafting most of the major legislation pertaining to the development and leasing of the mineral resources of the public domain.

Lamar Strickland, formerly an engineer with the oil and gas division of the Texas Railroad Commission in Corpus Christi, has joined Chicago Corp. as an engineer at the company's Bishop, Tex., field office.

Earl L. Perkins, graduate of the University of North Carolina, has joined the geological staff of the Argo Petroleum Corp.'s division office at Midland, Tex.

Dr. H. A. Ireland, senior geologist in charge of research and laboratory work for Standard Oil Co. of Texas, Midland division, is resigning effective September 1, to join the faculty of the University of Kansas as a professor of geology. Prior to joining Texas Standard at Midland, Ireland was a geologist for the U. S. Government for 10 years.

Paul R. Nilsson, formerly assistant Arizona division manager for General Petroleum Corp., has been named division manager to succeed **Stanley A. Wilson,** who has retired. Nilsson, who joined the company in 1923 in the engineering department at the Vernon, Calif., plant, served in the San Diego, Los Angeles, and Bakersfield offices before going to Arizona as manager of the Phoenix branch in 1944. Wilson, who joined General Petroleum in 1935 as a wholesale salesman at Salt Lake City, has been identified with the Arizona offices since 1938. During the war he was a member of the Petroleum Administration for War industry committee for Arizona.

Roy M. Teel, administrative assistant in the natural gasoline and gas department for Phillips Petroleum Co., has been appointed assistant manager of the department to supervise all sections of the engineering division. A graduate of Oklahoma A. & M. College, Teel joined the company in 1933 as draftsman in the engineering department.

SHIFTS—

Bryan L. Denson, engineer, Union Oil Co., Modesto, Calif., to Midland, Tex.; **R. E. Goode,** engineer, Pacific States Oil Co., Wilmington to Los Angeles; **Allen H. Blair,** engineer, Alamo Refining Co., W. Columbia to Old Ocean, Tex.; **Ardee Morgan,** superintendent, Trinity Drilling Co., Barnhart to Seminole, Tex.; **C. J. Bland,** foreman, Cities Service Oil Co., Sulphur Bluff, Tex., to Natchez, Miss.; **Robert R. Cocke III,** engineer, Railroad Commission of Texas, Austin to Corsicana, Tex.

Durward N. Jolley, geologist, Corpus Christi to San Antonio, Tex.; **W. O. Ham, Jr.,** geologist, Continental Oil Co., Fort Worth to Abilene, Tex.; **C. D. Cantrell, Jr.,** geologist, H. J. Porter, Midland to Houston, Tex.; **Jack M. Fillman,** engineer, Shell Oil Co., Inc., Houston, Tex., to Houma, La.; **Johnny Auten,** superintendent, P. W. Appelby, Odessa, Tex., to Colorado City, Tex.; **M. D. Olive,** foreman, Barnsdall Oil Co., Jennings to Elton, La.

Claude L. Jones, foreman, Shell Oil Co., Inc., Monroe to Farmerville, La.; **K. E. Jones,** engineer, Louisiana Liquefied Petroleum Gas Comm., Shreveport to Baton Rouge, La.; **George Lune,** engineer, Universal Oil Products Co., Robinson to Chicago, Ill.; **Carl G. Burklow,** engineer, M. W. Kellogg Co., Hammond, Ind., to New York, N. Y.; **J. B. Oakley, Jr.,** engineer, Stanolind Oil & Gas Co., Stafford to Ellinwood, Kans.

J. R. McLaughlin, engineer, McAlester Fuel Co., Norman, Okla., to Magnolia, Ark.; **John V. Blair,** engineer, Sinclair Prairie Oil Co., Oklahoma City to Tulsa; **Charles H. Hesser,** engineer, Stanolind Oil & Gas Co., Oklahoma City to Vivian, La.; **Morgan Bell,** engineer, The Texas Co., Marlow to Tulsa; **John J. Surko,** engineer, Pan American Production Co., Port Barre, La., to Houston, Tex.

Donald E. Smith, engineer, Skelly Oil Co., Duncan to Velma, Okla.; **H. L. Winchester,** superintendent, Pure Oil Co., Cisne, Ill., to Worland, Wyo.; **Hugh F. Naldrett,** engineer, Imperial Oil Co., Edmonton, Alta., to Devon, Alta.; **Hugh L. Riley,** engineer, Cities Service Oil Co., Oklahoma City to Graham, Tex.

DEATHS

George M. Giltinan, 61, a director of Seismograph Service Corp. and an officer of one of its subsidiary companies, died recently in Victoria Harbor, Ont. He joined Seismograph Service in 1933. He was named vice president in 1945 and a year later was appointed management advisor. From 1937 to 1939 Giltinan served in the geophysical department of Magnolia Petroleum Co.

Carl Williamson, oil pumper in the Kilgore, Tex., district since 1935 for Shell Oil Co., Inc., died July 20 in Gladewater, Tex.

Maple Taylor, 53, assistant superintendent of the Kansas division for Gulf Oil Corp., died August 1 near Lyons, Kans.

T. J. Hillhouse, 55, construction foreman for the Kermit, Tex., division of Magnolia Petroleum Co. for the past 13 years, died August 2 in Kermit. He joined the company in 1919.

H. Frank Johnson, formerly district engineer for Continental Oil Co. in Midland, Tex., died August 3 in Midland.

O. M. Cuniff, Sr., tool pusher for Mene Grande Oil Co. in Venezuela and whose home was in Houston, was killed in an automobile accident near Beaumont recently.

William J. Auberton, accountant for Humble Oil & Refining Co. for 20 years, died August 4 in Houston.

Mrs. Margaret Simpson Gay, 74, retired independent oil operator in northern Oklahoma and Kansas, died recently in Wichita, Kans.

Frank W. Fox, 65, retired consulting engineer for Standard Oil Development Co.'s Elizabeth, N. J., plant, died August 5 in Plainfield, N. J. He joined Standard Oil Co. (N. J.) 32 years ago.

Charles M. Wagner, 59, driller and tool dresser in the Pennsylvania fields, died August 4.

Clayton Mark, Jr., 59, vice president of Clayton Mark & Co., steel manufacturers, died August 5 in Chicago, Ill.

Wesley D. Simms, 42, attorney for Shell Oil Co., Inc., died August 4 in Tulsa. He was a member of the legal committee of the Mid-Continent Oil and Gas Association.

Virgil M. Wile, 53, retired Oklahoma driller, died August 2 in Tulsa.

Patrick J. Powers, 65, foreman of the boilermaker department of the Bayway refinery of Esso Standard Oil Co. for 29 years, died July 28 in Elizabeth, N. J.

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Concrete Pipe Used for Surface Casing In Two Mid-Continent Tests

by Neil Williams

ONE of the latest innovations in oil-well-drilling practice is the use of concrete pipe for surface casing. To date, two strings of concrete casing have been run. The first, totaling 228 ft., was in a well drilled by Charles E. Knox (inventor of the pipe) and Smith Drilling Co., near Marshall in Logan County, Oklahoma. The second, 206 ft. long, was in a well drilled by Phillips Petroleum Co. and Lewis Drilling Co. near Seward, Stafford County, Kansas. In both instances, the pipe was run without difficulty, and as a result several other operators already are contemplating its use in wells in other areas.

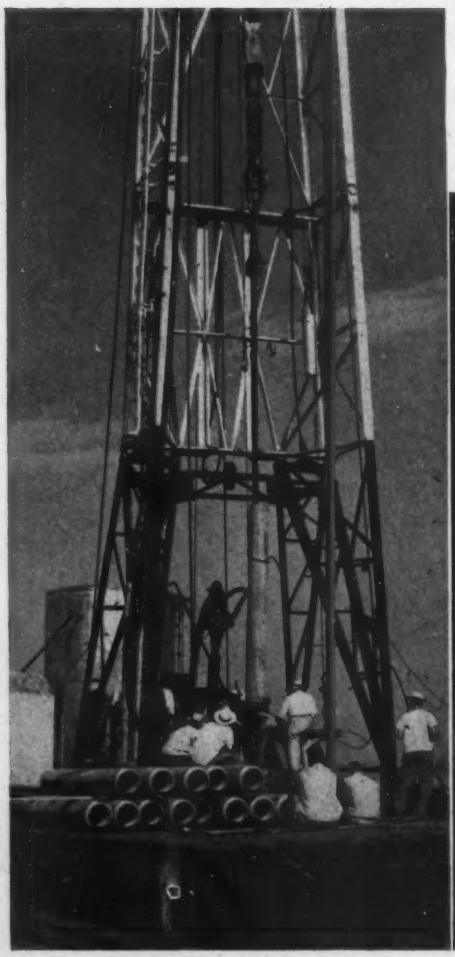
Concrete casing used in these wells was perfected by Knox Industries, Inc., of Enid, Okla., after years of laboratory and engineering tests. The pipe is of steel-reinforced, centrifugally spun construction, and was provided in 14-ft. lengths having an inside diameter of 10 in. and an outside diameter of 14 in. and weighing 90 lb. per foot. The two initial strings were manufactured by American Manufacturing Co. at Los Angeles, but Gifford-Hill American Co. of Dallas, a subsidiary, now has completed a plant at Wichita Falls, Tex., where pipe for the Mid-Continent area will be made. Pipe for the Oklahoma well was supplied through Lucey Products Corp. of Tulsa, exclusive distributor in Oklahoma, and for the Kansas well by Mountain Iron & Supply Co. of Wichita, exclusive distributor in that state.

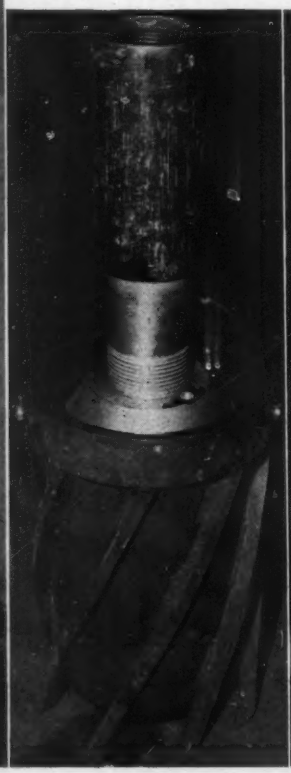
Reinforcing consists of nine ¼-in. steel rods wrapped diagonally in two directions with ¼-in. steel rod spaced and welded every 4 in. Ends of each section are fitted with special alloy-steel shoulder collars welded to the reinforcing rods forming an integral unit. Collars are made with lock

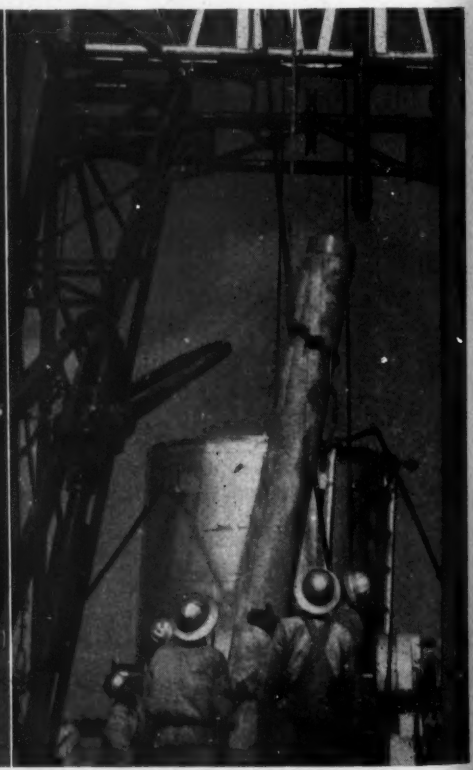
Left: Running concrete surface casing in Charles E. Knox and Smith Drilling Co. well near Marshall, Okla. Casing joint stripped over drill pipe is being lowered by catline for connection into top of preceding joint

Center: Shoe for concrete surface casing string with left-handed thread sub connection for screwing onto bottom of drill pipe. Casing sets on and is welded to shoulder. Shown is Neoprene rubber ring gasket seal. Spiral steel ribs centralize string in hole and effect circular cement flow upward from ports. Rib extensions provide legs to anchor string on bottom of hole while cementing

Right: Stripping first casing joint up over bottom of drill pipe supported in derrick by elevators. Lifted by catline, first casing joint is stripped up over bottom of drill pipe supported by elevators in derrick







joints, and grooves for a round ⅝-in. Neoprene rubber ring gasket to insure positive seal of connections under compression. Enough tolerance is provided in the joint connections to allow 10° to 15° of flexibility from vertical in the string. Rated compression strength of the pipe is 5,500 lb. Floatability is 60 per cent fluid.

The casing is designed for a maximum setting depth of 2,500 ft. although it is anticipated that until use of the pipe becomes more generally established only shorter strings will be run. Use of the casing is expected to be of particular advantage in areas where corrosive water is present in the surface sands or electrolysis conditions affecting steel pipe are bad. Currently, the savings in scarce steel which it may effect may be of importance. At present, cost of the pipe is somewhat above that of steel but it is anticipated that as soon as volume production is attained its cost will be reduced to a comparable or even lower figure.

Whether the pipe will be suitable for use in wells in which high pressures must be controlled still is a debatable issue. However, it is assumed that with the pipe properly set and the annulus filled with cement the pipe will be capable of withstanding most any pressures that might be encountered. In testing the cement job in the first string that was run, a pressure of 350 psi. was built up. At that pressure a leak developed but it was not due to any failure in the concrete-pipe portion of the string. As a means of connecting surface control equipment, the top joint of the string consists of a short section of steel pipe welded onto the top collar of the cement pipe and the leak occurred in that section possibly at the weld.

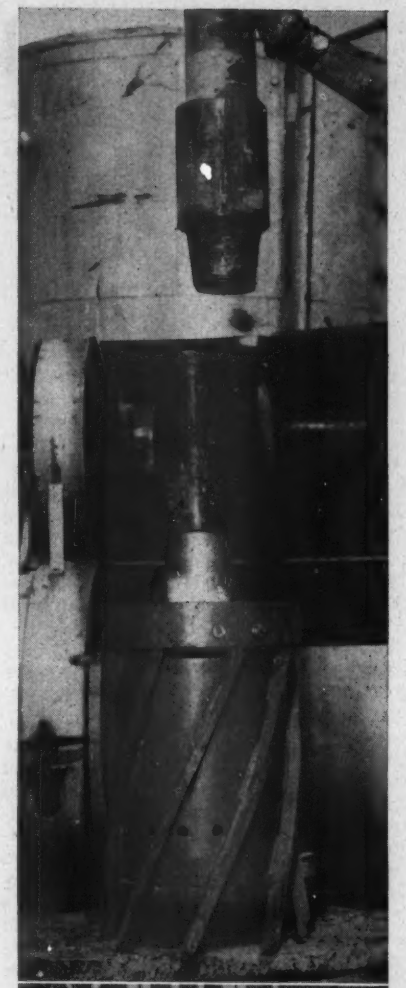
Special Guide Shoe

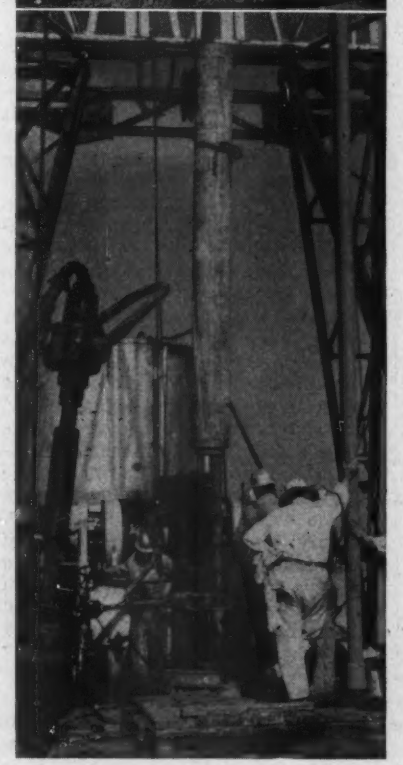
To cement the string a special casing or guide shoe, designed by Halliburton Oil Well Cementing Co., is provided. This functions as a conventional float shoe but on the outside wall there is a series of spiral steel ribs leading upward to the top from the bottom ports. The ribs serve a triple purpose. Extending below the shoe they form legs, which when the string is on bottom, anchor the string securely during the cementing operation. They also centralize the shoe and string in the hole and act to spiral or whirl the cement upward from the ports to prevent channeling.

The opening in the top of the shoe is provided with a threaded connection for screwing on to the bottom of the drill pipe when running and cementing the string. Left-handed threads are employed to permit backing off the drill pipe after cementing.

The casing is run under compression with the entire weight carried by the drill pipe until the string is on bottom. To start, the first joint of drill pipe is picked up by the elevators and held suspended in the derrick while the initial joint of casing is stripped

(Continued on page 87)





Upper right: Lowering drill pipe to screw into sub connection on casing shoe. Casing joint, stripped up over drill pipe, then will be lowered and welded onto shoe shoulder

Left: Welding bottom collar of first casing joint to shoulder of casing float shoe preparatory to starting in hole

Right: Making up additional drill-pipe joint with next casing joint, held by catline, stripped over pipe. Casing joint then will be set down and joined to casing string by lock-joint compression seal

Steps In Engineer's Program of EVALUATING an OIL PROPERTY

by Earl A. Nichols

Engineering methods are presently developed to where the engineer can determine with precision the volume of oil to be recovered from a given property, and accurately calculate the present worth of the future net income. This article describes the procedures used, both in the field investigations and for the engineering calculations. The author graduated from Texas Christian University in 1937 with a major in physics and mathematics, and did graduate work at Washington University in St. Louis. From 1938 to 1941 he was with Carter Oil Co. and Phillips Petroleum Co. Later he was employed by Core Laboratories, Inc., Dallas, before organizing his own consulting business in Dallas. One of his present activities is reservoir engineering for Reddin Field Conservation Association.

ONE of the first steps in an engineer's program for evaluating a property is the field examination and testing of the wells and equipment. The exact method and tests employed vary because of the wide variation of well conditions encountered.

If the wells are flowing and if they have significant reservoir pressure the program generally takes the following pattern:

Flow tests at one or more choke sizes are conducted over a period of several hours. During any individual test, measurements are made periodically of the oil production, water production by grind-out percentage, and casing and tubing pressures. On key wells, these tests are made with a recording bottom-hole-pressure bomb in the well in order that the productivity index may be obtained under various producing conditions.

In order to calculate the productivity index, the static bottom-hole pressure also will need to be measured. On key wells, a gas meter is attached to the separator vent line to obtain data for calculating the gas-oil ratio under various choke conditions. At the conclusion of such tests, the over-all production of water is obtained by drawing down the tank bottom and measuring the amount of water accumulated.

During the tests, the engineer should leave the well on a given choke long enough for the production per period to become stabilized, the well-head pressures to become steady, and the gas volume to level out. He should then take several sets of readings under stabilized conditions. The over-all time required will vary from well to well. If the well has a high capacity, that is, the permeability of the productive zone multiplied by the effective thickness of the zone is a large numerical figure, then the time will be relatively small as compared to a tight, low-capacity well.

Data for Pumping Wells

If the wells are pumping, some of the above-described tests must be changed. As a rule it is not practical to pull the pumping equipment out of a well in order to run a pressure bomb. Even if a bomb is run for the static test, the flowing bottom-hole pressure is lacking for a productivity-index test. Frequently in pumping wells, the fluid-level measurements made by one of the methods using the timing of sound waves is helpful in arriving at changes in bottom-hole pressures due to pumping the well.

Specifically, the data taken on a pumping well is as follows:

The production of oil and water, the well-head pressures if any, and the quantity of gas produced are measured. During the tests it is also necessary that data be taken regularly until and some time after all of the producing characteristics have become stabilized. With pumping wells the engineer must be on the alert for wells "pumping off." Another condition which must be recognized is the heading up and surging of fluid in wells which have considerable reservoir pressure. Many wells which have only recently been put on the pump are actually only agitated by the pump and flow in heads. The periodic data on such wells are frequently erratic.

Whether the wells are flowing or pumping, the gravity of the oil should be measured. If the appraisal is being made for the purpose of a possible water flood, a sample of the oil should be taken for a viscosity determination. Also, the produced water should be sampled for a water analysis.

Gas Wells

If the property contains gas wells, the engineer normally obtains the following type of data. He is usually most interested in making an open-flow potential test of the well or wells. If a bottom-hole-pressure bomb is available, the static and the flowing bottom-hole pressures with the wells flowing on three or more various-sized chokes are obtained. The quantity of gas measured under each of these conditions is recorded. The gas temperature at the well head is measured.

The amount of liquid, if any, that is released from the gas is recorded. Often the amount of liquid is so small that it is measured in the separator rather than risk the error of attempting to obtain its volume in a large-diameter stock tank. Unless the elaborate field equipment necessary for measuring the density and the deviation factor of the gas is on location, it is desirable that samples of the well effluent be obtained for laboratory tests to be made later for those values.

If a pressure bomb is not available, the engineer may obtain the capacity of a dry gas well by the open-flow method described in Monograph 7, Bureau of Mines report, "Back-Pressure Data on Natural Gas Wells and

Their Application to Production Practices," by Rawlins and Shellhardt.

Equipment and Well Records

While the evaluation engineer is on the property, he makes an inventory of the surface equipment. The amount of detail necessary is usually determined by the nature of the evaluation assignment as well as the methods employed by the engineer. In every instance the number and approximate size of all buildings are recorded. A list of the approximate length of line pipe, number and size of stock tanks, number of heaters and separators, and general types and sizes of pumping equipment is made. Also the engineer checks the acreage against that given on the map, as well as checking a few of the neighboring wells, if possible.

Many times the well-completion and past production records are kept at the field office. If so, he must obtain all of these data, which he will need later, while in the field.

And then there is the last of the field duties, but not the least important, which is listening and obtaining scattered bits of information from pumpers, foreman, and neighboring personnel. To handle this part of the assignment well, probably more experience is required than any of the previously discussed phases. Much of the information is either trivial or misleading and must be discarded, but occasionally information of great value to the engineer is obtained in this way.

Calculation of Reserves

After having completed the field testing, the engineer has virtually completed the process of accumulating current basic data on the property. He must then use these data and other data previously taken by the operator to arrive at an estimation of the volume of oil to be obtained from the property, the rate at which the oil will be produced, and the value of this oil to the future owner. There are several possible methods of arriving at these conclusions.

The age of the property and primarily the data available to the appraiser determine the method employed. If the past production has been of sufficient length of time to have established a trend, the production-decline curve method is one approach. If the amount of reservoir data available is sufficient, the volumetric method may be employed. Each of these methods will be discussed.

Production-Decline Curve Method

The production-decline curve method is based upon the apparent fact that the unrestricted rate of production from a given well declines during the life of the production. The rate of this decline has been a basis for many investigations. A review of these investigations and an analysis of the various types of decline curves under use has been published by J. J. Arps.[1] The two most prominent forms presently used are the **hyperbolic** and the **exponential** types.

TABLE 1—LOSS RATIO METHOD OF HANDLING EXPONENTIAL DECLINE

Month—	Year	Monthly production rate, P	Loss in production rate during 6-month interval, ΔP	Loss ratio; monthly a=6P/ΔP
January	1943	305	....	....
July	1943	286	—19	—90.5
January	1944	268	—18	—89.4
July	1944	251	—17	—88.6
January	1945	235	—16	—88.0
July	1945	220	—15	—88.0
January	1946	207	—13	—95.5
July	1946	194	—13	—89.6
January	1947	182	—12	—90.8
July	1947	171	—11	—93.3
January	1948	160	—10	—96.0
July	1948	150	—10	—90.0

The **exponential**-type decline curve fits a reservoir whose relation of production plotted versus time on semilog paper will yield an approximate straight line. The mathematical expression for such a relation may be expressed as follows:

$$P = P_o e^{-t/a}$$

where

P = production rate at any time, t
P_o = production rate at beginning
T = time in months
a = positive constant
e = log base of 2.718+

As may be seen from this formula, the drop in production per unit of time is proportional to the production rate. As was pointed out in Arp's paper, the easiest way to handle this type from a statistical standpoint is the loss-ratio procedure. Table 1 gives an example of such a tabulation.

For extrapolating this production into the future one could use an average loss ratio, a, of 90.9. These same data are presented in graphical form on Fig. 1. Either the statistical method or the graphical extrapolation is relatively simple to handle. For this reason, the exponential-decline-curve method of predicting the future recoverable oil is more commonly used than any of the others.

The **hyperbolic** type of decline is the one which occurs most frequently. However, the graphical use of this method is more tedious and the method is less frequently used for that reason. Production of the hyperbolic type, when plotted on semilog paper, yields a curve. Extrapolation of this curve involves the normal expected chance of error in extending a curve very far past the known points. When such data are plotted on log-log paper, a straight line is the result (see Fig. 2). It is, however, frequently necessary to shift the curve until the proper position is located which will yield a straight line. The dotted curve on Fig. 2 shows the same values plotted in one of the positions which yielded a curve, previous to shifting to the position which gave a straight line.

The hyperbolic decline fits the following mathematical expression:

$$P = P_o \left(1 + \frac{bt}{a_o}\right)^{-1/b}$$

where the slope of the straight line

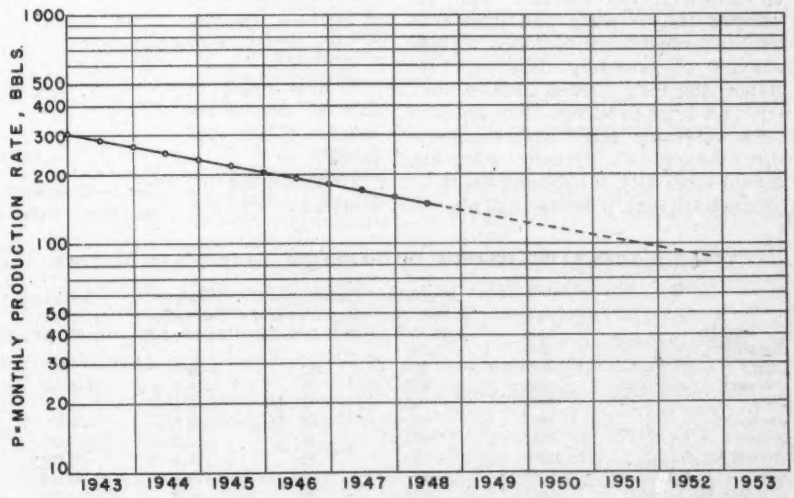


Fig. 1—Example of expotential-type decline curve, where monthly oil-production rate is plotted against time (data from Table 1, above)

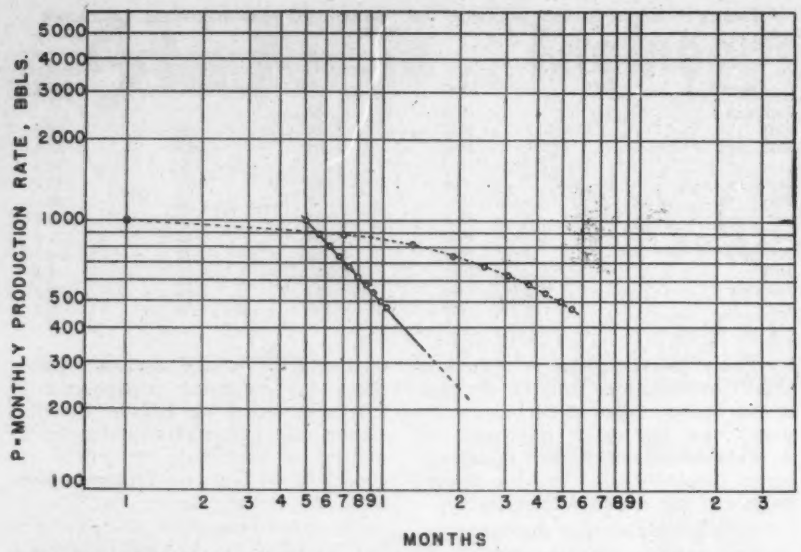


Fig. 2—Example of plotting hyperbolic-type decline curve (oil rate vs. time) on log-log paper. The data points may be shifted in equal intervals to obtain straight line for extrapolation, as shown. Data from Table 2, below

on log-log paper is —1/b. The statistical approach to the hyperbolic decline method is shown in Table 2.

In each of the two above-discussed methods of using the past production of a well or lease to give an estimate of the future expected production, it is easily seen that the longer the past production history is available, the greater the accuracy of the estimated production will be. In any of the production-decline methods of obtaining an estimate of the future recoverable oil, one is confronted with the possibility that certain past production practices which have influenced the production rate might be altered in the future and destroy the validity of the extrapolation.

Volumetric Method

In order to make a complete and accurate volumetric analysis of a given property, the operator who developed the property and later produced it must have obtained a large amount of scientific data. For instance, the tests needed include electric and/or sample logs, core-analysis data, reservoir fluid analysis, pressure surveys at periodic intervals, gas-oil-ratio data, oil-water-ratio data, productivity-index measurements, oil production by wells or leases by months, water production, and a tabulation of any water or gas that might have been returned to the reservoir. In most cases a volumetric analysis can be made by assuming or estimating certain portions of the misison information, but the resulting conclusions are thereby weakened.

Basically the two important answers to be derived from a volumetric analysis are:

1. How much oil is now in the reservoir under consideration?

2. How much of that oil can be recovered at the surface?

To obtain the oil-in-place value, one must determine the areal extent of the reservoir, the net thickness of the productive zone, the pore volume of the productive formation, and the percentages of pore space filled with water and hydrocarbons.

If the field development is nearly complete, the areal extent is not too difficult to define. However, the appraiser cannot draw a boundary line around the outermost wells on a map and call that the limits. If there are several productive zones, one of them may extend over a much different area from that of another. Also he must determine if permeability pinchouts, faults, or similar phenomena have separated a given zone into more than one distinctive reservoir.

Normally a cross-section map such as is shown in Fig. 3 for a West Texas field, is helpful in determining the continuity of the productive zones. The individual zones shown in Fig. 3 are very distinctive on the electric logs and are easily followed from well to well.

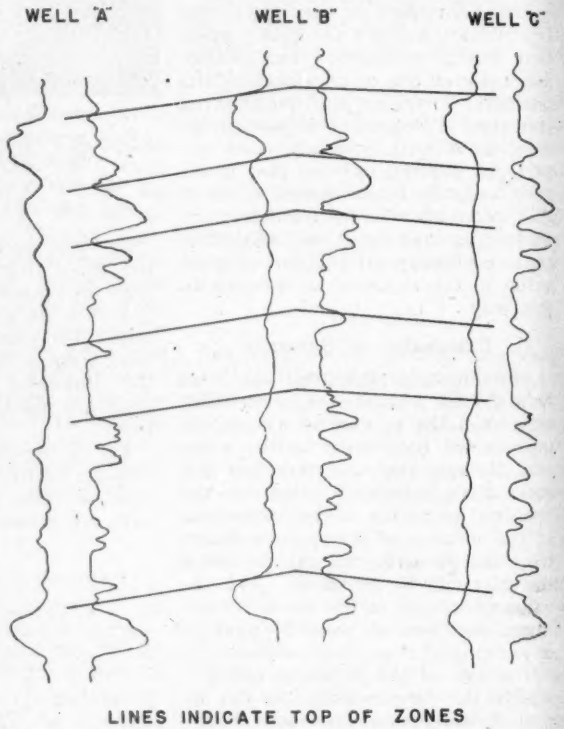


Fig. 3—Cross-section of a West Texas field as provided by electric logs. Note correlation of individual zones obtained in this instance

TABLE 2—LOSS-RATIO METHOD OF HANDLING HYPERBOLIC DECLINE

Month—	Year	Monthly production ratio, P	Loss in prod. rate, 6-month intervals, ΔP	Monthly loss ratio, a=6P/ΔP	Delta loss ratio, b=(6P/ΔP)/6
January	1943	1,000	...	...	....
July	1943	899	101	—53.5	....
January	1944	815	84	—58.1	—0.766
July	1944	743	72	—62.0	—0.65
January	1945	681	62	—66.0	—0.67
July	1945	628	53	—71.2	—0.634
January	1946	582	46	—76.1	—0.816
July	1946	541	41	—79.2	—0.516
January	1947	505	36	—84.2	—0.834
July	1947	473	32	—89.0	—0.80

Average value of b = —0.718.

The possibility of faulting or permeability pinchout between wells must be considered. This factor can be further evaluated by studying the bottom-hole-pressure history. Two areas, separated into individual reservoirs, will usually become apparent when several pressure surveys are worked up in contour form. Occasionally the P.V.T. data from reser-

voir fluid analysis may be helpful in determining whether one segment of a reservoir is in communication with another.

Thickness of Pay Zones

After the surface area has been defined, the next step is to arrive at the net thickness of the pay zone. An examination of the electric logs, drilling-time logs, and drill-cuttings sample logs will usually give a rather reliable estimate of the gross thickness of the pay zone. In some areas it will also divulge the next pay thickness. However, the net effective pay section can best be defined after studying the results of the core analysis data, where the core recovery has been high. If the fluid content of the pores is favorable, and the permeability is above the value assigned necessary for fluid flow, the interval represented by the analysis may be considered effective. Since the effective thickness is a multiplier in the oil-volume formula, care must be exercised in arriving at this value. This is especially true with the Permian basin fields where the limestones and dolomites are nonhomogeneous and the thick sections have only spotted saturation.

The multiplication of the surface acres by the average net thickness gives the total reservoir sand volume in acre-feet. Some investigators multiply this figure by a recovery factor expressed in barrels per acre-foot to obtain an estimate of the total expected recoverable oil. Frequently such factors are based on previously experienced recoveries in fields of a similar nature. Such a method, when used by a capable engineer or geologist in an area where he has had wide experience, can be satisfactory. The most reliable method in most instances, however, is to use measured formation data and calculate the oil in place and finally the recoverable oil. The oil in place can be calculated by using the following formula:

$$V = \frac{7{,}758 \times \phi \times (1 - Scw)}{F.V.F.}$$

where

V = barrels of stock-tank oil per acre-foot.

ϕ = fractional porosity of rock.

Scw = connate-water saturation, per cent pore space.

F.V.F. = formation volume factor, volume that 1 bbl. of stock-tank oil occupies in reservoir.

The fractional porosity is obtained by a laboratory determination of the relation of the pore volume to the bulk volume of a representative sample of the producing rock.

One method of obtaining the connate-water saturation of the producing strata is the capillary pressure procedure.[3]

The formation volume factor is obtained by a laboratory determination of the shrinkage experienced by a barrel of oil under reservoir condition that is transferred to stock-tank conditions in the same pressure and temperature cycle as is experienced in actual field operations.

Recovery Versus Pressure Decline

If sufficient basic information, such as relative permeability data, is at hand, the investigator may calculate the recovery from a dissolved-gas-drive oil reserve in barrels per acre-foot, as a function of reservoir pressure. He is thus able to establish the recovery for any assumed minimum economic pressure condition. In these calculations he is also able to predetermine the produced gas-oil ratio as a function of the recovery. A set of these curves is shown in Fig. 4.

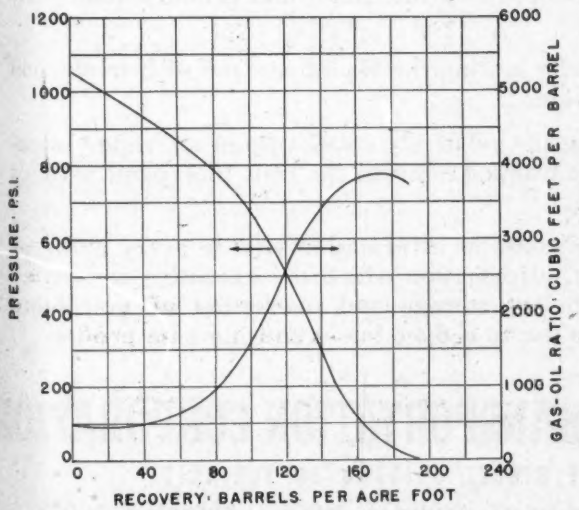


Fig. 4—Oil-recovery in bbl. per acre foot, plotted as a function of reservoir-pressure decline (for dissolved-gas-drive reservoir). Produced gas-oil ratio also is plotted

If the reservoir has a known water drive, or if a water flood project is anticipated, the recovery in barrels per acre-foot may be calculated as a function of the produced water cut. Again, the engineer is able to establish the recovery at any water-cut percentage which has been set as the economic limit.

With such values of recovery per acre-foot to apply to the reservoir volume in acre-feet, the appraiser is able to establish the total expected recovery from the property with an accuracy as high as is possible with our present-day engineering methods.

Material Balance Equation

In order to know whether to apply the recovery factor of a dissolved-gas-drive mechanism or of a water-drive system to a given reservoir frequently requires additional investigation. The past recovery in barrels per pound pressure drop is a significant clue. The water-oil ratio of the wells may be helpful. To actually determine the rate of water influx, if any, into the reservoir, one may use some form of a material-balance equation and calculate the water intrusion. One form, derived by Schilthuis[4] and discussed by Old[5] is as follows:*

$$\Delta n\,[u + (r_o - r_o)v] + z = n\,[(u - u_o) + m\,u_o\,(\frac{v - v_o}{v_o})] + Z$$

Another form, developed by Hurst[6] is:*

$$Z = \frac{-2\pi\,(144)\,K\,\sigma\,H\,R^2}{5.62\,\mu\,a^2} \int_0^{\theta} \frac{dp}{d\theta'}\,G\,[a^2\,(\frac{\theta - \theta'}{R^2})]\,d\theta'$$

With such formulas as these, one is able to compute the volume and rate of water which has encroached into the reservoir. If the water influx has been significant, the recoveries will be best represented by the water-drive recovery figures previously discussed.

To obtain the future recovery one must subtract the past production from the total recovery calculated by the volumetric method.

The rate at which this future recovery may be expected can be estimated by use of the productivity-index equation:[7]

$$I = \frac{5.9 \times 10^{-4} \times K \times T}{\mu \times F.V.F.}$$

I = productivity index, bbl. oil per day per lb. pressure differential.

K = average permeability of exposed thickness, md.

T = net thickness exposed, ft.

μ = viscosity of reservoir fluid at reservoir condition, cp.

F.V.F. as defined previously.

These data should tie in with the information obtained by the engineer during his testing of the wells on the property.

*See Old's and Hurst's papers for nomenclature.

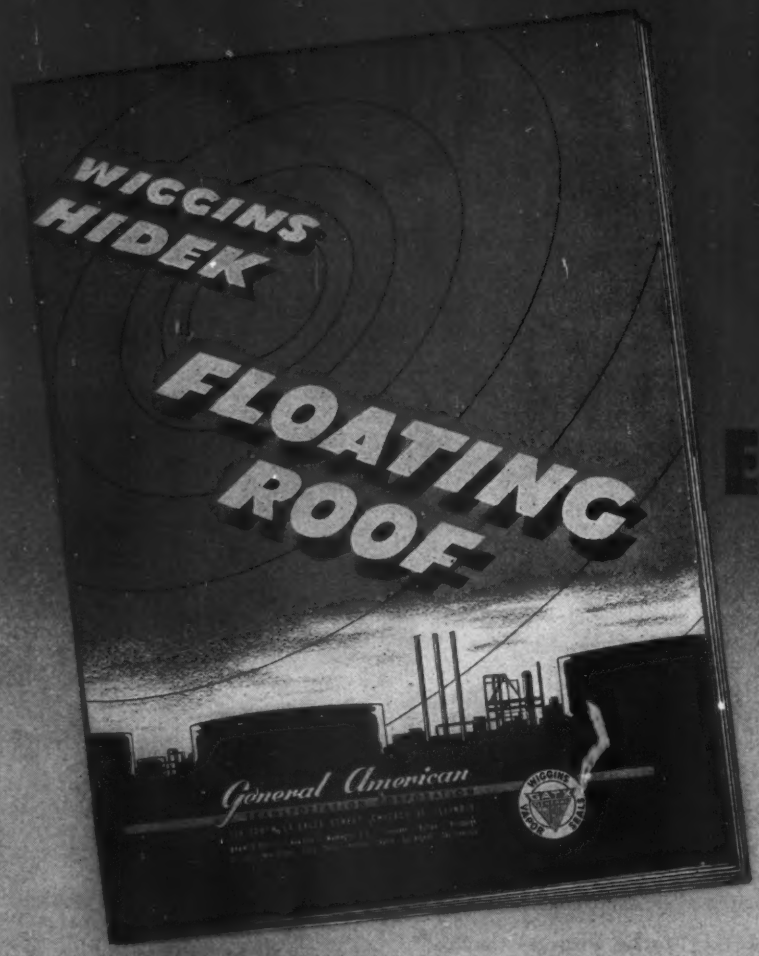


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TABLE 3—PRESENT WORTH OF FUTURE PROFITS

Year	Production, bbl. Gross	Production, bbl. Net	Income at $2.50 per bbl.*	Operating cost at 25c/bbl.	Operating profit	Interest charge	Operating profit after interest	Development cost	Payout at end of year	Profits after payout	Present worth Factor	Present worth Amount
1	36,000	31,500	$78,750	$9,000	$69,750	$8,500	$61,250	$295,000	$233,750	.....	.....	.....
2	147,500	129,050	322,630	36,880	285,740	7,032	278,708	100,000	178,708	$178,708	0.890	$158,050
3	186,000	162,750	406,870	46,500	360,370	.....	360,370	.....	.....	360,370	0.863	311,000
4	104,000	91,000	227,500	26,000	201,500	.....	201,500	.....	.....	201,500	0.813	163,820
5	96,500	84,450	211,130	24,130	187,000	.....	187,000	.....	.....	187,000	0.766	143,240
6	88,000	77,000	192,500	22,000	170,500	.....	170,500	.....	.....	170,500	0.722	123,100
7	83,200	72,800	182,000	20,800	161,200	.....	161,200	.....	.....	161,200	0.681	109,780
8	78,500	68,680	171,700	19,880	151,820	.....	151,820	.....	.....	151,820	0.642	97,470
9	73,400	64,220	160,550	18,300	142,250	.....	142,250	.....	.....	142,250	0.605	86,060
10	69,000	60,370	150,930	17,250	133,680	.....	133,680	.....	.....	133,680	0.570	76,200
11	66,400	58,100	145,250	16,600	128,650	.....	128,650	.....	.....	128,650	0.537	69,090
12	63,100	55,200	138,000	15,800	122,200	.....	122,200	.....	.....	122,200	0.507	61,960
13	59,700	52,230	130,580	14,930	155,650	.....	115,650	.....	.....	115,650	0.478	55,280
14	55,500	48,560	121,400	13,880	107,520	.....	107,520	.....	.....	107,520	0.450	48,380
15	52,300	45,750	114,380	13,080	101,300	.....	101,300	.....	.....	101,300	0.424	42,950
	1,259,100	1,101,660	$2,754,150	$315,030	$2,439,120		$2,423,598			$2,020,598		$1,546,380

Income taxes, assumed at 20 per cent = $309,276. Estimated present worth of future profits $1,237,104

*Production tax previously deducted.

Calculation of Gas Reserves

Gas reserves may be calculated by the following formula:

$$Vs = \frac{1.541 \times 10^6 \times Pr \times \phi \times (1 - Scw)}{Zr\ Tr}$$

where

Vs = cubic feet of gas at standard conditions per acre-foot.
Pr = reservoir pressure, psia.
Tr = reservoir temperature, °Rankine (°F. + 460).
Zr = gas compressibility factor and ϕ and Scw same as previous use.

The reservoir temperature and pressure are best and easiest obtained by field measurement. The gas compressibility may be measured directly in the laboratory or it may be estimated by use of published charts and knowledge of either the gas composition or the gas density.[3]

Economics

After the evaluation engineer has determined the best possible value of the future recoverable oil, he must apply the economic factors to transform the barrels of oil into net present worth in dollars.

The calculations involved in a typical economic adjustment of recoverable oil is shown in Table 3. The estimated future oil production is tabulated yearly in the second column.

The gross production is then multiplied by the working interest of the property owner to obtain the "net production." In the example it was a full seven-eighths working-interest lease.

This value is then multiplied by the pipe-line price per barrel, less the production tax, to yield the income per year. From this value the lifting cost for the working interest and its pro rata share of the royalty interest oil is deducted.

The value of the lifting cost per barrel in many instances is an arbitrary value. The appraiser may study the past costs of operating the property and arrive at a value, but he is not at all certain that the figure will fit the future. If the wells are flowing, the lifting cost will likely be rather small. When the wells are later put on the pump, the lifting cost will increase materially. The amount of water handled in the past must be compared to an estimate of the future water production.

The age and condition of the pumping equipment, the treating costs, production of oil per well per day, possible increase or decrease in personnel for handling the wells, and field supervision efficiency are same of the factors to be considered. The cost can vary from a few cents to well over a dollar per barrel.

After deducting the operating cost, the resultant figure might be called the operating profit. In the early life of a property the interest charge on the unreturned portion of the capital invested is considered. The operator is well aware of this item if the development capital is borrowed money.

The development cost itself is deducted to give the "profit after payout." Many people consider the total of this column as their profit on the property. However, since some of the money will be received a number of years hence, a discount factor should be applied to arrive at the true worth of the profit at the present time. Because of the loss of the yearly interest rate on money to be received in the future, the discount factor becomes progressively larger the greater the number of years before receiving the money.

For instance, the present worth of 1 dollar to be received during the fifth year, using a 6 per cent interest rate converted semiannually, would be 0.766 × $1.00 or 76.6 cents. Likewise, a dollar received the tenth year would be presently worth only 57 cents. For that reason, it is advisable to alter the profits after payout by a discount factor to give the present worth of the profit. The total of this column will give the prospective buyer a good estimate of the total profit to be expected from the property.

Since the income-tax problem is a field of great specialization these days, the engineer will normally be wise to allow the buyer's tax adviser to alter the above profit to give the final net profit after taxes, rather than to attempt to arrive at a figure himself.

Salvage

The appraiser may choose to include in his report an analysis of the salvage value of the surface equipment, casing, and miscellaneous items. This is pertinent when the probable period of salvage is rather close at hand. If it is many years hence, the physical condition of the equipment as well as the market price of salvage may be doubtful factors.

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BOOKS

TWENTIETH CENTURY PETROLEUM STATISTICS. Published by DeGolyer & MacNaughton, Continental Building, Dallas. 63 pp.

This is the fourth annual edition of this volume, which was first prepared in 1945 in the Office of the Director of Naval Petroleum and Oil Shale Reserves in the Navy Department, Washington. Statistics are included for all phases of the petroleum industry, both domestic and foreign.

Flexible OPERATION

. . achieved through instruments at Roosevelt Oil Co. refinery

*by S. D. Ross**

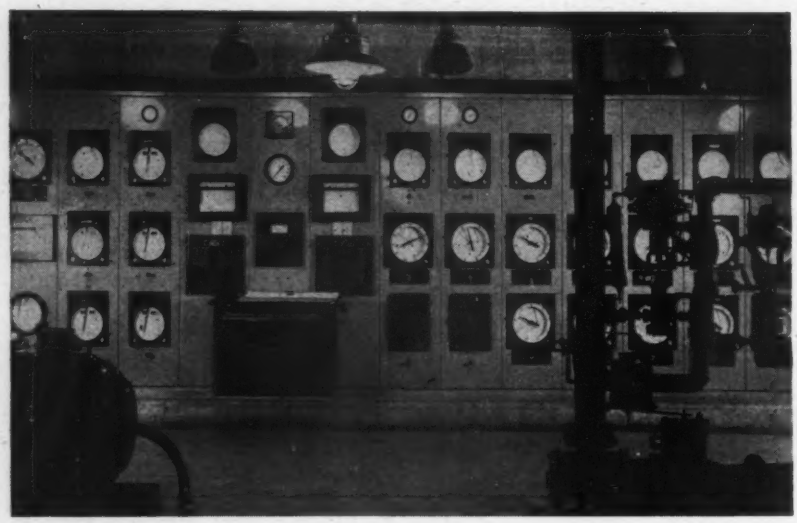


Fig. 1—Partial view of central control panel in pump room at the Roosevelt Oil Co. refinery

PROCESSING less than 10,000 bbl. per day of petroleum crude, the Roosevelt Oil Co. refinery at Mt. Pleasant, Mich., represents a typical small, continuous processing unit wherein full advantage has been taken of advanced instrumentation as an aid to efficient operation.

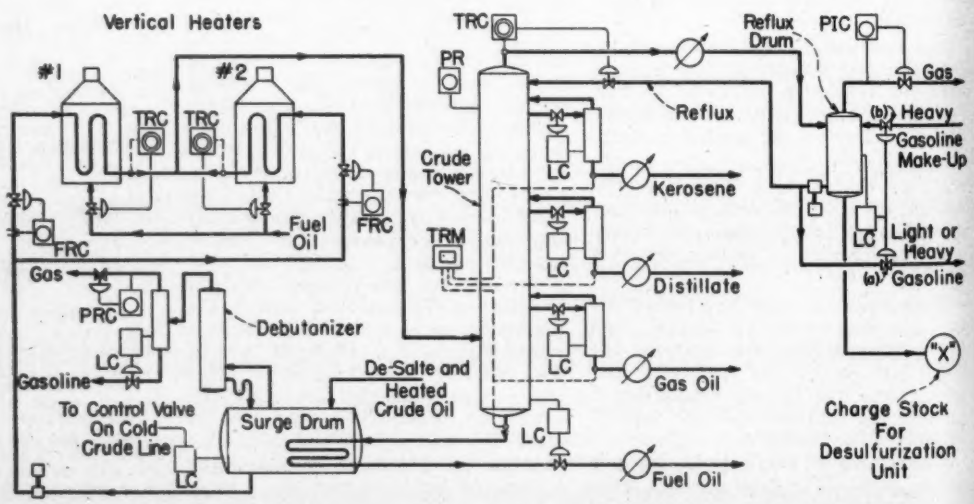
In addition to the standard production of fuel oil, other distilled crude side cuts and gasoline marketed under the trade name of Power Flight, this company specializes in a line of naphtha products finely distilled to meet a variety of specifications for such uses as paint and varnish solvents, lighter fluids, as well as rubber and detergent solvents.

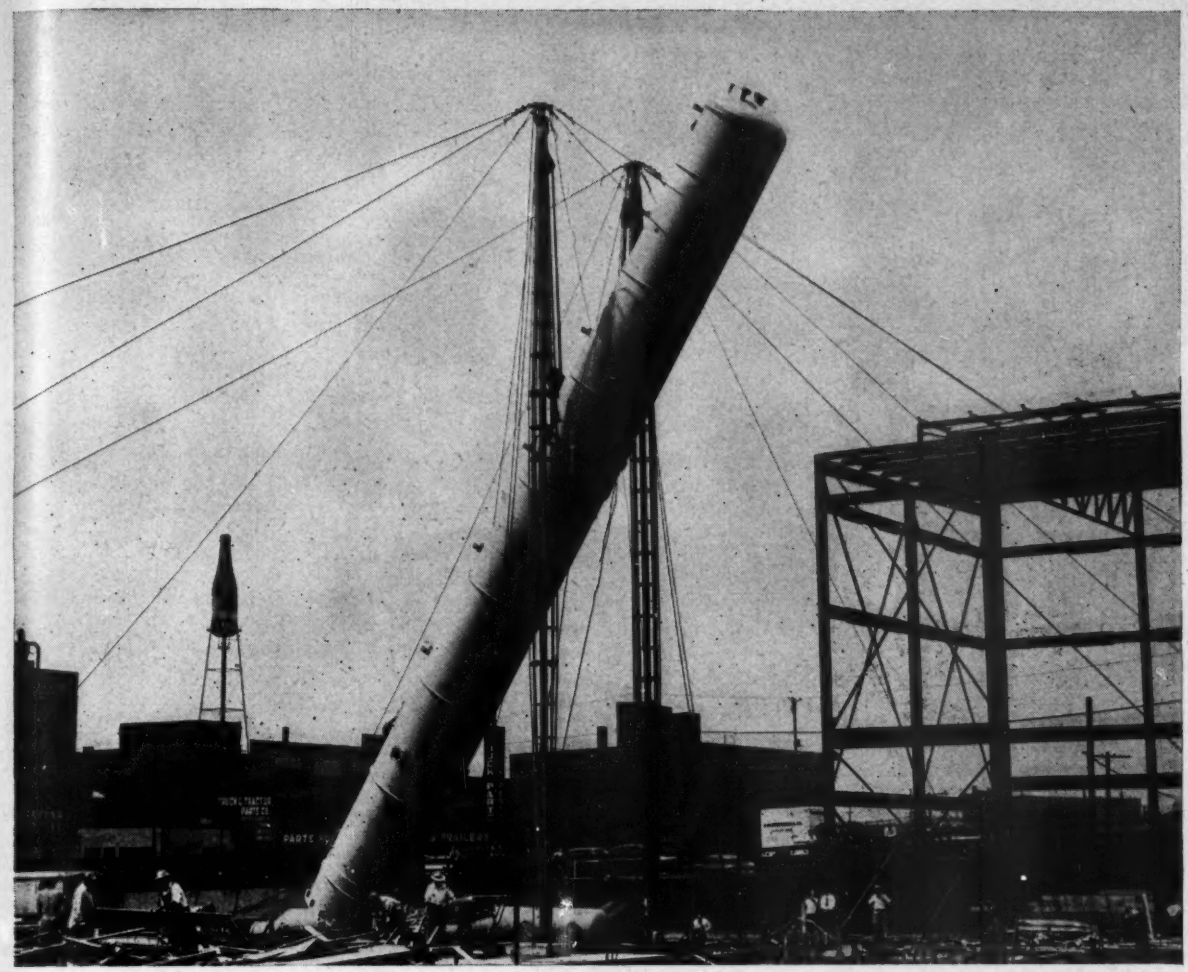
These products require a high degree of separation of hydrocarbons which have narrow boiling-point ranges and call for a close supervision of operating conditions obtainable by automatic and highly responsive instrument control. The instruments and control valves are so arranged that periodic changes in processing, to meet different product specifications, can be accomplished with a minimum of lost production time.

The three accompanying process flow diagrams outline the essential operations and instrumentation employed for the three main units, namely: (1) crude unit, (2) desulfurization unit, and (3) naphtha unit, which are separately discussed in this article. A centralized instrument panel board in the pump room (see photographic views) contains practically all the recorders and controllers, with the exception of direct-connected, displacement-type level controllers. Because of the relatively short transmission distances, pressure controllers are directly connected to the process without pneumatic transmission; the flow

*Technical section, Brown Instrument Co., Division of Minneapolis-Honeywell Regulator Co.

Fig. 2—Process flow diagram for crude unit
- *LC—level controller*
- *PR—pressure controller*
- *FRC—recording flow meter*
- *PIC—indicating pressure controller*
- *PRC—recording pressure controller*
- *TRC—recording electronik temperature controller*
- *TRM—multipoint electronik recorder*





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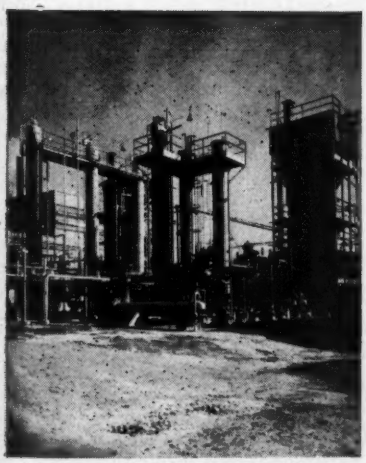

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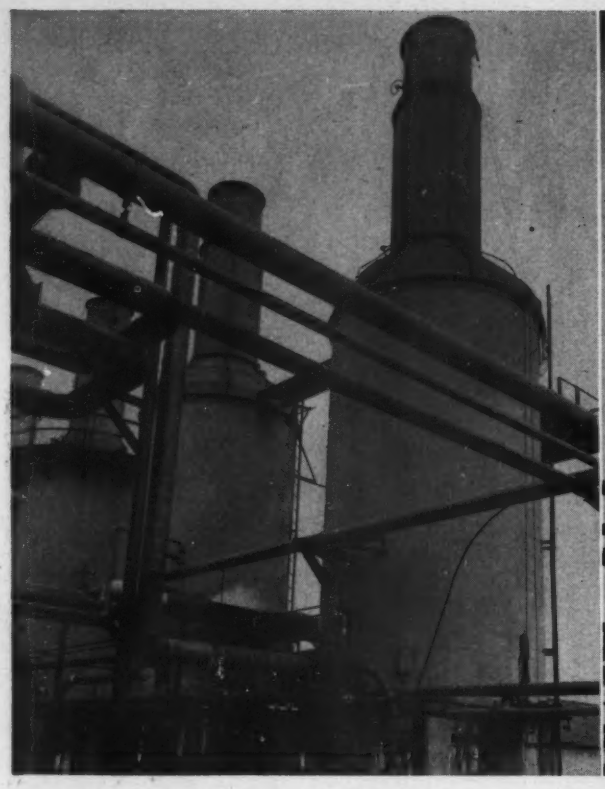

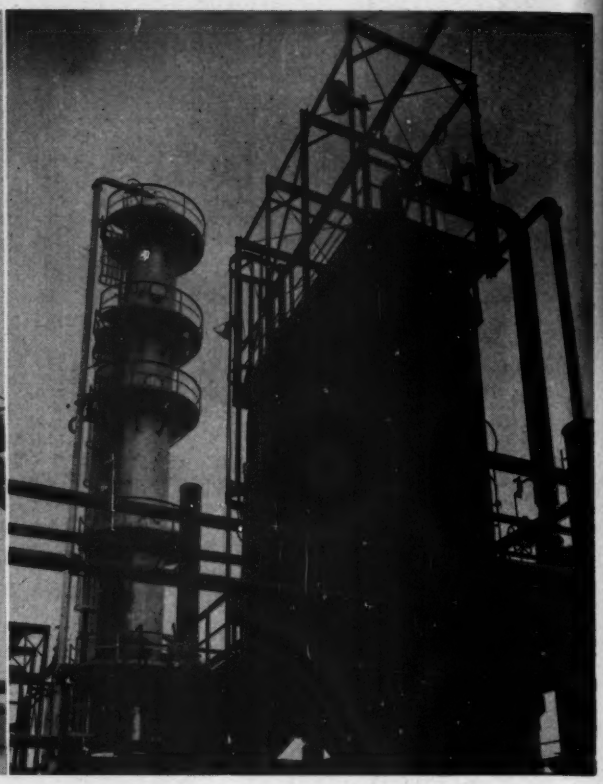

Fig. 3—(Left) View of vertical heaters. Fig. 4—View of two catalyst chambers showing Brown weather-proof type thermocouples installed in wall. Crude tower is visible in background

controllers employ the Brown inductance bridge system with electric meter bodies located near the point of measurement.

In all, this small refinery utilizes a total of over 60 instruments for indicating, recording, or controlling the process temperatures, levels, and flows. These include some 20 recording electronic pyrometers with pneumatic control and manual bypass stations; about 10 electric flow controllers; approximately 15 pressure recorders or recording pneumatic controllers; several multiple-record, strip-chart electronic pyrometers; and a precision indicator with selector switches for nearly 100 temperature points throughout the refinery.

Crude Unit

As shown in the diagram, the crude unit provides the primary treatment for portions of the crude used to produce naphtha cuts as well as end products—such as side cuts from the crude tower, and gasoline from the debutanizer and the tower reflux accumulator.

Cold crude, flow controlled from level in the surge drum, passes through a heat exchanger in the tower overhead line (not shown) and is mixed with a small amount of water under flow control for treatment in Perco electric desalters. After removal of salt, the crude is introduced into the surge drum where the oil is further heated by exchange with bottoms from the crude tower.

Volatile hydrocarbons vaporized in the surge drum are fed into a debutanizer column, the overhead from which passes into a receiver. Gas is released from the top of the receiver by a recording pressure controller, while gasoline is withdrawn as bot-

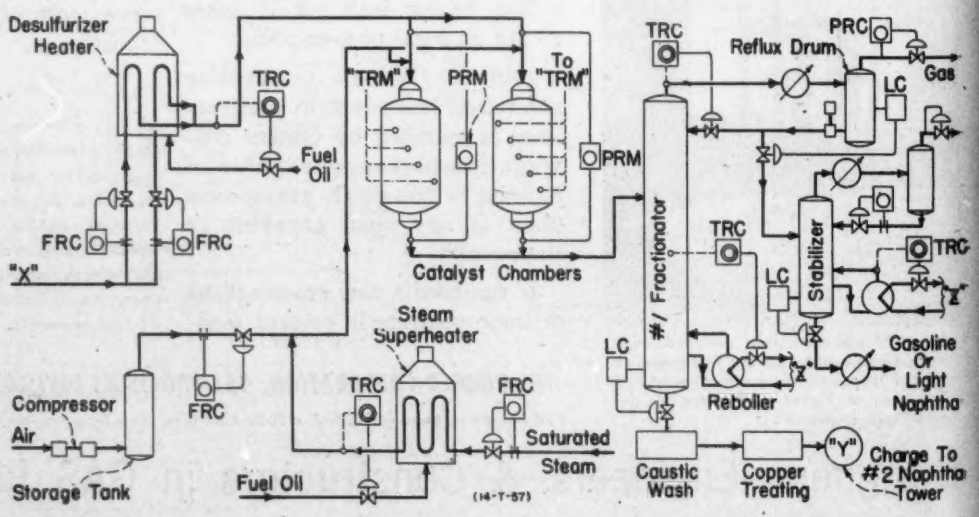

Fig. 5—Process flow diagram for Perco desulfurization unit
LC—level controller
FRC—recording flow controller
PRC—recording pressure controller
PRM—two-pen pressure recorder
TRC—recording electronic temperature controller
TRM—multipoint electronik recorder
Z—reboiler oil from heater

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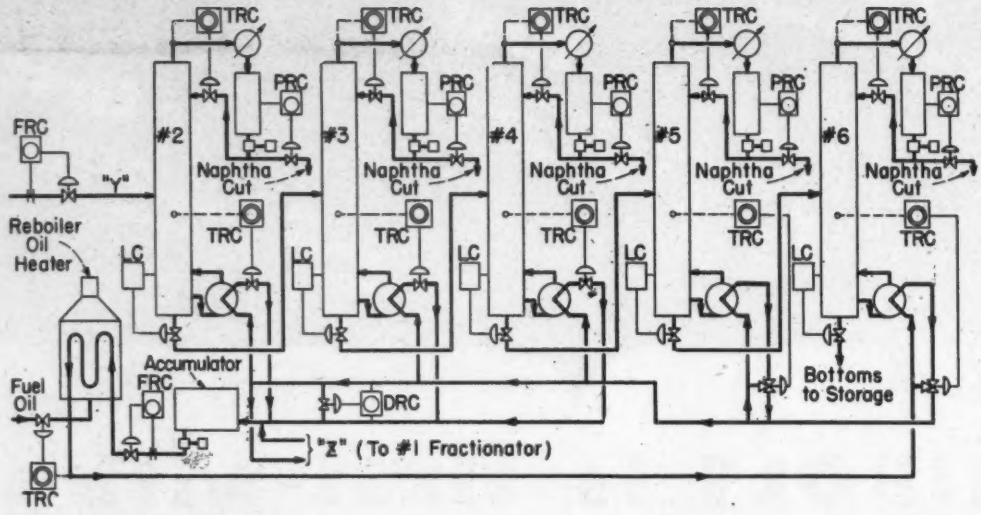


Fig. 6—Process flow diagram for naphtha unit

LC—level controller
DRC—differential pressure recording controller
FRC—recording flow controller
PRC—recording pressure controller
TRC—recording electronik temperature controller
Z—reboiler oil from heater

toms under the dictates of a level controller.

Crude oil from the surge drum is heat exchanged with both the gas-oil side cut and the fuel-oil bottoms of the crude tower before it is fed into the two vertical heaters in parallel, as shown in the flow plan. Inlet oil flow to each heater is controlled by a recording electric flow meter with pneumatic control, while the outlet oil temperatures are maintained by separate electronic pneumatic controllers operating diaphragm motor valves on the fuel lines to the heaters.

Instrumentation

Instrumentation of the crude-oil tower includes level controllers on the side-cut strippers and the bottoms, a tower pressure recorder, and top of tower temperature control, by means of an electronic potentiometer (range 200°-600° F.) which regulates reflux to the tower. A multipoint electronic recorder charts the outlet temperatures of the three side cuts and the bottoms.

The liquid-level controller on the reflux accumulator is arranged to operate either of two valves, as follows: When the naphtha unit is used, the level controller is connected to diaphragm motor valve "b" in the "heavy gasoline makeup" line and the bottoms outlet "x" (charge stock for desulfurization unit) is opened; no gasoline is taken off to storage (diaphragm motor valve "a" is fully closed). When the naphtha unit is not used, the level controller is connected to valve "a," valve "b" is closed, and the bottoms outlet "X" is closed. Noncondensable gases are taken off the top of the accumulator under pressure control.

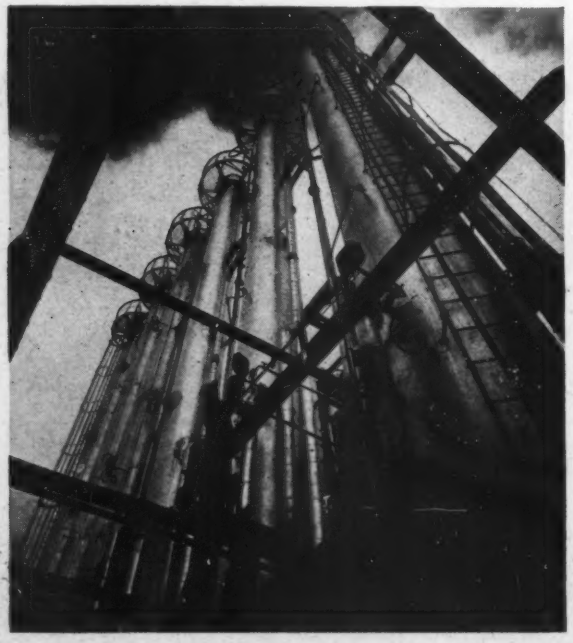
An electronic precision indicator (range 0°-1,600° F.) on the panel board is connected through multiple switches to 94 temperature points throughout the three process units, both for the purpose of checking controller thermocouples and for periodic checking of supplemental operating temperatures. In the crude unit, the following points are connected to the indicator:

1. Firebox, stack, oil inlet, and oil outlet of each vertical heater.
2. Sidecuts and bottoms products as well as inlet and top of crude tower.
3. Crude oil in surge drum.

Desulfurization Unit

The primary purpose of the desulfurization unit, as the name implies, is to remove sulfur from the hydrocarbon charge stock "X" before its fractionation in the naphtha unit. This is accomplished by heating the charge and mixing it with superheated steam just prior to its entrance to fixed bed catalyst chambers. The sulfur content

(Continued on page 109)



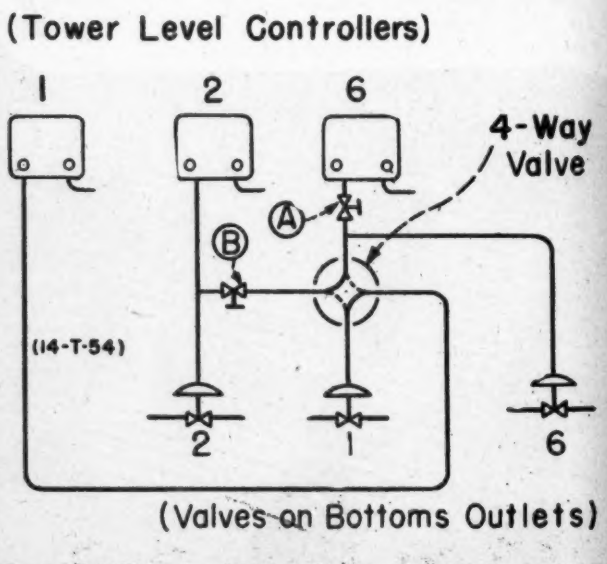


Fig. 7—(Left) View of naphtha superfractionator towers showing I. Foster adjusting bottoms level controller. Fig. 8—(Above) Schematic diagram of valve interlock system

Jet Casing Cutter Saves Hours In California Demonstration

by Herndon David

USE of a new type "jet cutter" has been demonstrated successfully for the first time at Signal Hill, Calif., reducing to 20 minutes a casing-cutting job that normally would require from 10 hours to several days.

The job was performed at Victory Oil Co. 4 Rhoda, Section 31-4s-12w, in Long Beach field. This particular well was to be abandoned and owners were desirous of recovering as much of the 6⅝-in. casing from the hole as possible. Inasmuch as there was no derrick over the hole, an ordinary hydraulic pipe-pulling machine and an ordinary mast were employed for bailing operations and for pulling the pipe.

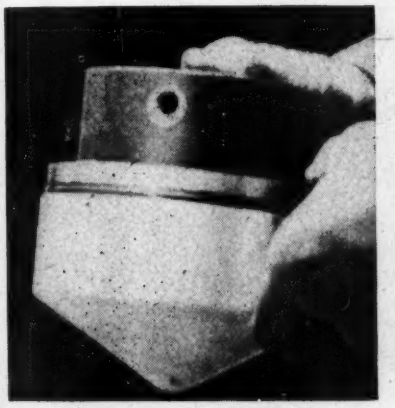


Fig. 1—Jet cutter for 6⅝-in. casing, showing small size of tool which facilitates ease of handling and simplifies use

Procedure was as follows: A Magna-Tector* was run to ascertain the lowest point of the casing, which was found to be at 4,530 ft. The Magna-Tector was then withdrawn from the hole and the jet cutter run into the hole on the same electric conductor cable and lowered to the correct depth. The pipe was severed instantaneously and the tool withdrawn from the hole only 20 minutes later. A total of only 2 hours was required to determine the lowest free point of the casing, cut the pipe, and pull the tools from the hole.

Operation of the jet cutter is similar to that of an acetylene torch. The cutter itself, Fig. 1, contains a combustible fluid which is ignited electrically from the surface. Jet action of the burning fluid against the pipe severs the pipe instantaneously, leaving a clean, burned edge as shown in Fig. 2. The heat generated by the burning also destroys the cutter, but the tool works equally as well in a hole full of fluid or in a dry hole.

Besides the saving in time, the jet cutter entirely eliminates the need of running in and out of the hole with tubing or drill pipe, and the necessity of rotary machines and mechanical cutters. For running into the hole, the cutter is mounted on the bottom of a sinker bar and connector with a casing centralizer to hold it in the center of the pipe. The complete assembly is attached to a wire line, Fig. 3, which may be a line used for an electric log, gun perforator, or Magna-Tector.

Use of the jet cutter also adds a great safety factor to casing-cutting operations, since damage to tools and chances of accidents are practically eliminated.

The jet cutter was developed in Houston and has been used successfully on the Gulf Coast for several months. The demonstration at Signal Hill, however, was the first in the Pacific states and is indicative of the trend toward adaptation and wider use of newer and simpler tools in the drilling industry.

Fig. 3—Jet cutter mounted on bottom of sinker bar and connector ready to run into hole. Complete assembly is attached to same wire line used by Magna-Tector

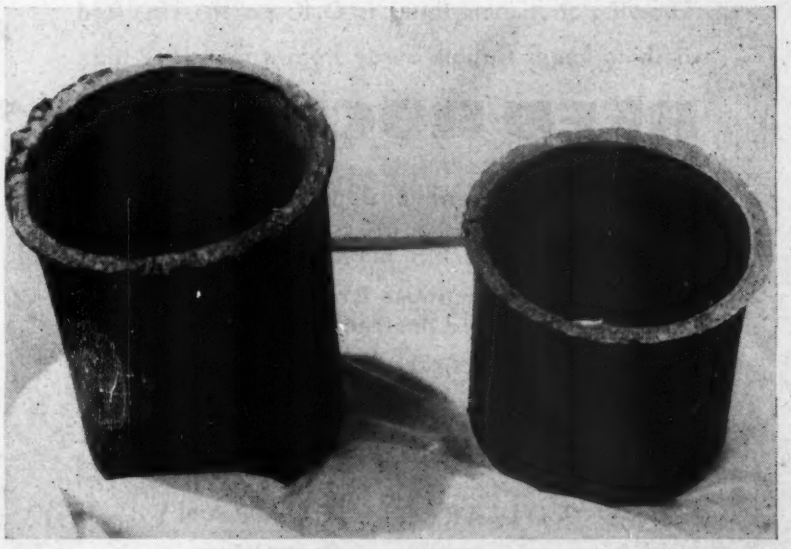
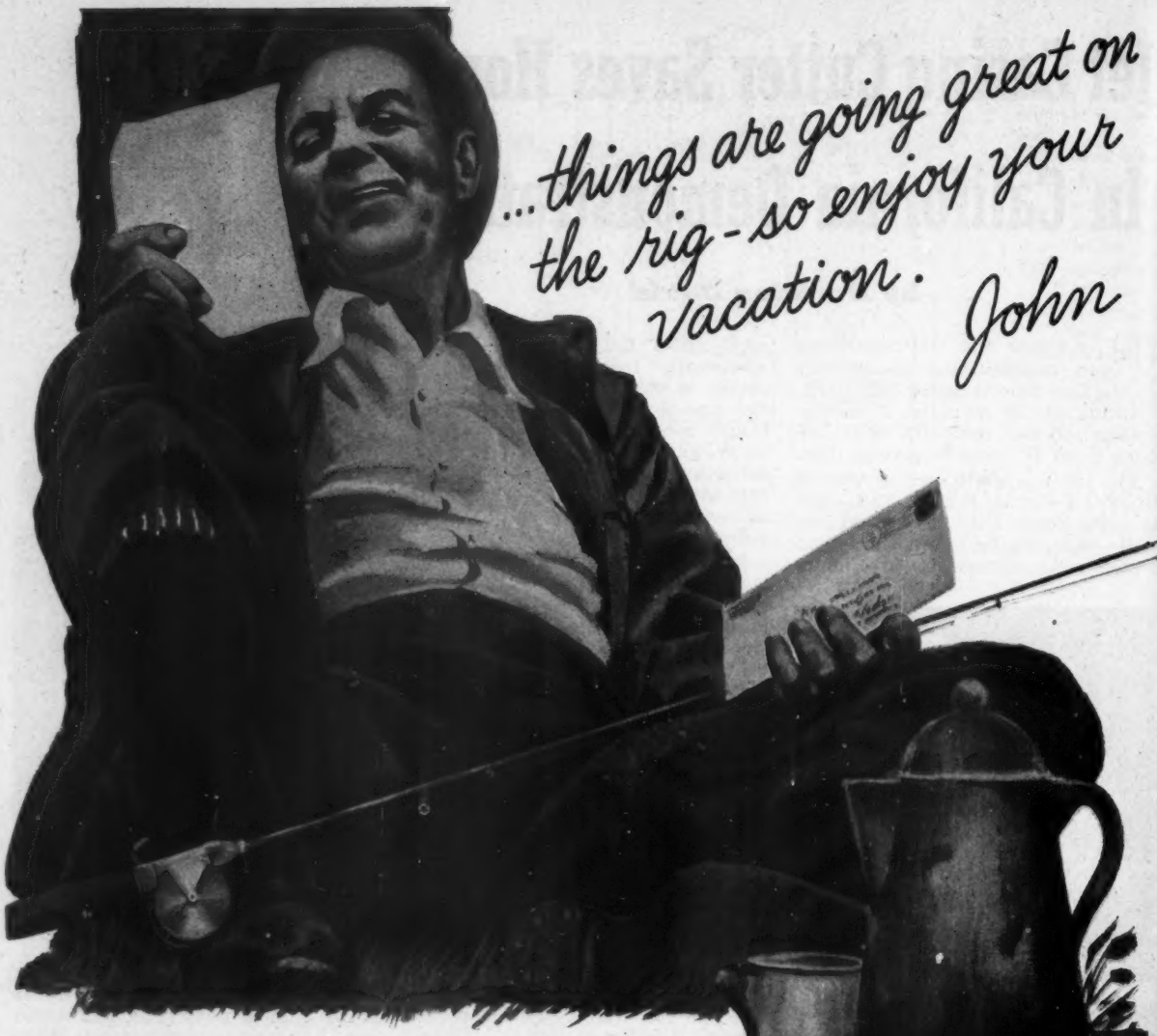


Fig. 2—Samples of 6⅝-in. casing severed with jet cutter. Pipe on the left was cut at a depth of 3,100 ft. in a well full of liquid. Pipe on the right was cut at a depth of 4,520 ft. in a dry hole

*See "Stuck Point of Frozen Pipe Accurately Determined by New Electronic Tool," by Herndon David, The Oil and Gas Journal, June 10, 1948, page 107.



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Concrete Pipe Used for Surface Casing

(Continued from page 67)

up over it from the bottom with the catline. The shoe then is screwed onto the bottom of the drill pipe using a short sub for the left-handed thread connection. After this, the casing joint is set down on the shoe and welded into place around the collar. The drill pipe, with the attached shoe and casing joint, then is lowered into the hole to a point just above the top of the casing joint where it can be engaged and held by the slips while the elevators are released and the second casing joint is picked up with the catline and stripped down over the top. After reengaging the elevators and removing the slips the latter casing joint then is set down, locked, and sealed under compression into the top of the first joint. The drill pipe is again lowered in the hole

Connecting casing sections showing lugs on upper (male) collar for locking into lower (female) collar, also the round Neoprene rubber ring gasket in groove around shoulder of female collar. Visible is top of one of two imprinted spirals on exterior wall of casing joint to give circular flow of cement to aid in preventing channeling

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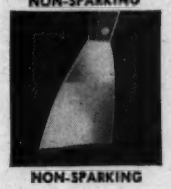

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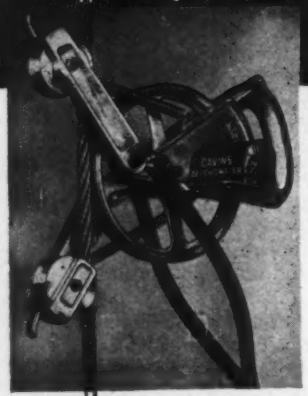

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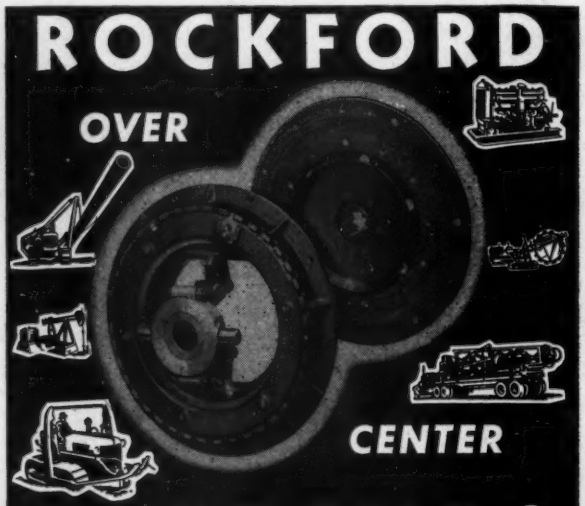

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ROCKFORD CLUTCH DIVISION
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to a point where the slips can be engaged and hold the string.

With 31-ft. joints of drill pipe being used, each will accommodate two of the 14-ft. joints of casing leaving room at the top for the slips. The next joint of drill pipe with another joint of casing stripped over the bottom is made up in the string, and in turn, the operation of adding successive joints of casing and drill pipe is repeated until the full string is run. As previously mentioned the string is surfaced with a short section of steel pipe, about 15 to 20 ft. long, to permit welding the surface connections to the string.

Cement for the string is pumped through the drill pipe and out the ports of the shoe to the casing annulus as in any conventional operation. The exterior wall of the casing is made with two imprinted spirals, each with two complete turns per joint. These tend to impart a circular flow of cement behind the pipe and assist in preventing channeling. When the cement sets, they also serve to provide a locking bond between the casing and the walls of the hole. After sufficient cement is pumped to get returns to the surface, the drill pipe is backed off from shoe by turning to the right. Before pulling, the pipe is raised about 2 ft. and mud or water pumped through it and out the inside the casing to clean out any cement that might have been left in the pipe or inside the casing. Drill pipe then is pulled and the job is complete.

Run in 4 Hours

The initial 228-ft. string of concrete casing was run in approximately 4 hours, but in this job extra time was consumed in observing each step and also in delays for photographing each operation. It is estimated that at least an hour and a half might have been cut from the job. Approximately 150 sacks of cement were used on this string although it was calculated that 35 more sacks than necessary were handled. The hole later was drilled to a total depth of 4,577 ft. where it was abandoned as dry. In drilling below the surface casing, 4½-in. drill pipe with 5¾-in. o.d. standard A.P.I. tool joints was used. Tool joints were calipered carefully after the hole was abandoned to check on the wearing action of the concrete but the wear was negligible, even less than normal when drilling through steel pipe. As a test run, drill-pipe protectors purposely were not used in order that the maximum wear might result.

The pipe is formed in a horizontal, cylindrical vat which is rotated at 3,000 to 3,200 r.p.m. while the cement slurry is being pumped into it. It is from the rotation of this vat that the pipe is described as "centrifugally spun." The centrifugal force of the rotation discharges from the vat all excess water from the slurry while the pipe is being formed, insuring uniform cement setting and drying. After removal from the vat, the pipe is thoroughly sundried and later is washed with dry steam to remove all trace of any remaining moisture. Manufacturers claim that the pipe cannot be damaged in normal handling and shipping operations. The new plant at Wichita Falls now is in full production.

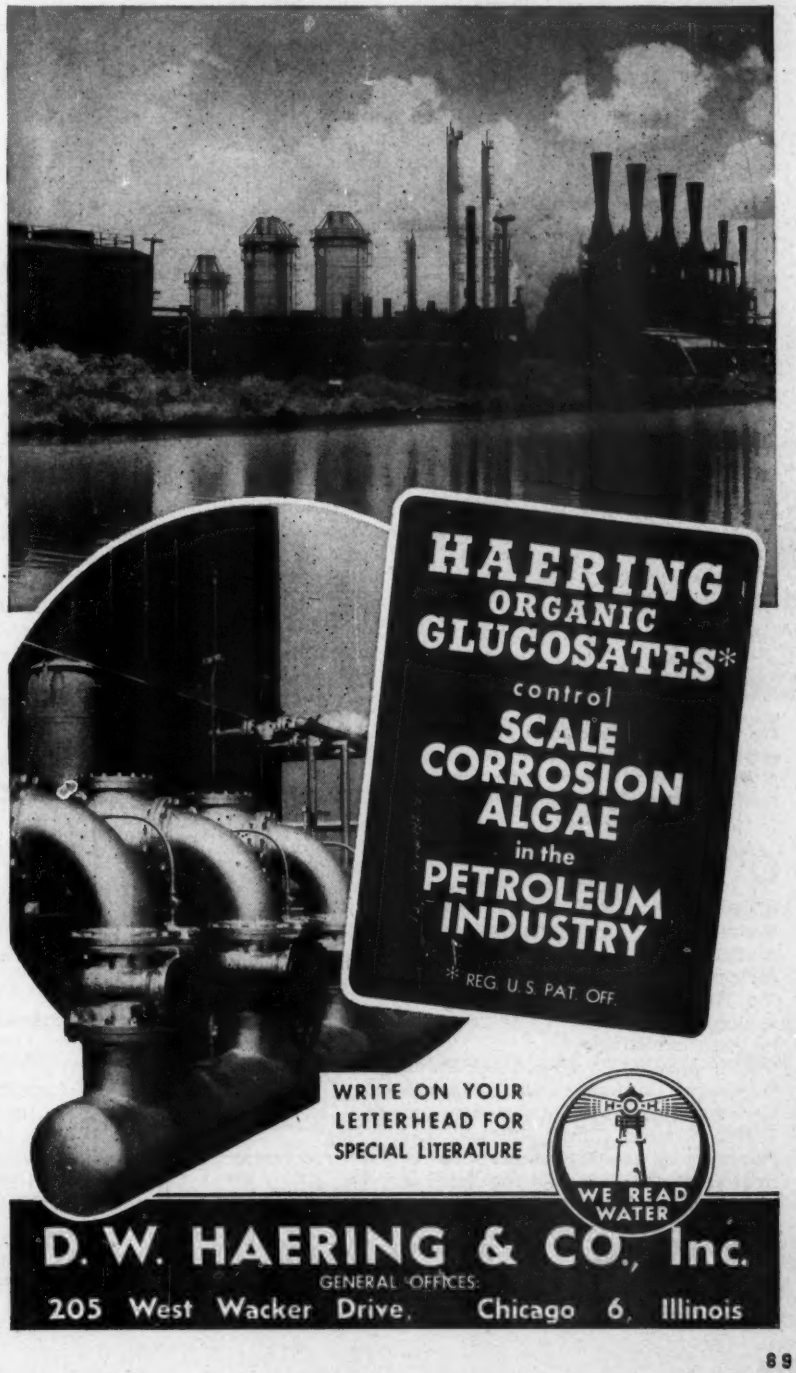
BOOKS

MOLYBDENUM: STEELS, IRONS, ALLOYS. By R. S. Archer, J. Z. Briggs, and C. M. Loeb, Jr. Published by Climax Molybdenum Co., 500 Fifth Avenue, New York. 391 pp.

This book, available to metallurgists and other producers and users of alloys, is divided into 10 sections, which thoroughly cover the subject of molybdenum. In addition there is an appendix section, chiefly tables. The volume is replete with charts and tables, and graphs which clarify the text for the graph-minded reader.

A WORLD TOUR IN OIL. By Dr. Alfred M. Leeston, 1000 Continental Building, Dallas. 35 pp. 50 cents.

By no means a detailed description of oil operations, this little booklet nevertheless gives adults and students alike a general idea of the oil resources in many countries.



Hypersorption

. . . this process provides precise concentration-separation of gases

by Arch L. Foster

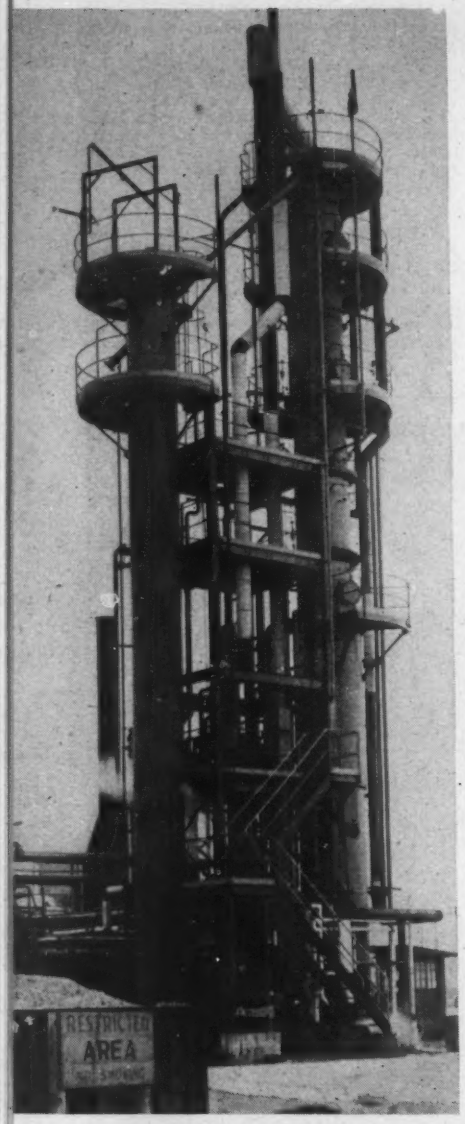


Fig. 1—Most recent installation of the Hypersorption process is that of Dow Chemical Co. at Midland, Mich. It recovers ethylene from cracked gases, for chemical syntheses

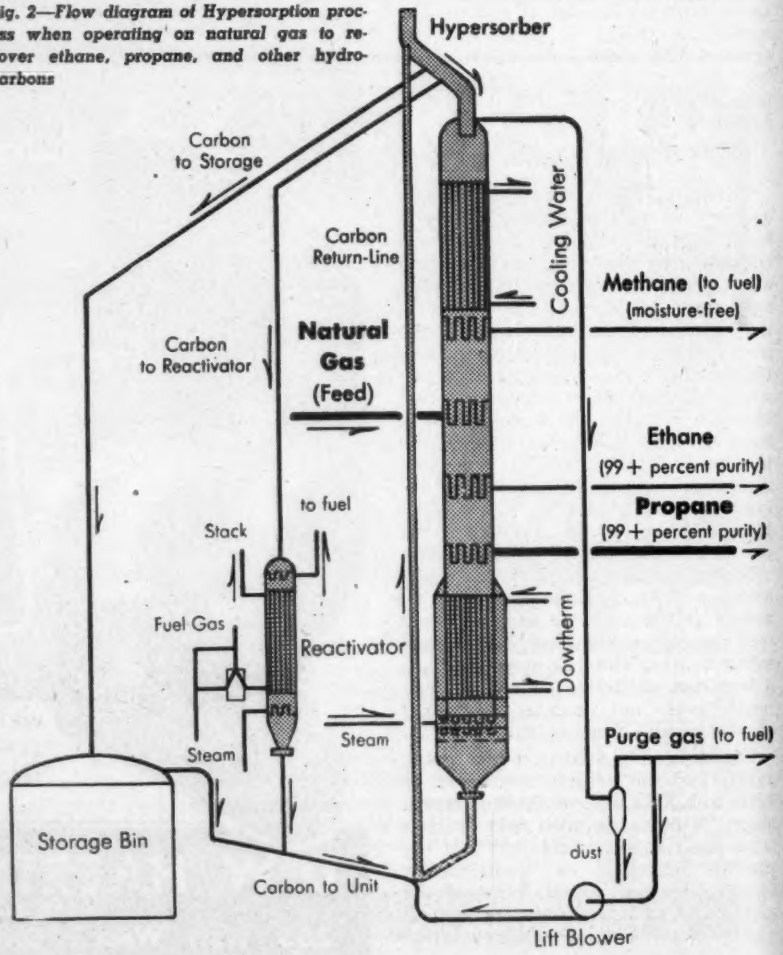
OFFERING a practical solution of one of the major problems of petroleum, petrochemical, and gas industries—that of concentration-separation of normally gaseous hydrocarbons and/or nonhydrocarbons—the Hypersorption process bids fair to become one of the major processes in these industries.

This process, developed by Union Oil Co. of California, with units designed and built by that company and Foster Wheeler Corp., employs the principle of selective adsorption of hydrocarbons by a moving bed of activated carbon particles, with the subsequent removal of the adsorbed hydrocarbons by heat and steam. It has been applied especially to the recovery of ethylene and like substances found in relatively low concentrations in natural gas, where high recoveries and high concentrations of the products are desired.

Retention of hydrocarbons on activated charcoal is greater than in absorption oil (used conventionally for recovery of liquefied petroleum gases and natural gasoline in hundreds of plants). For example, the amount of methane or CH_4 retained on carbon at 1 psia. is 90 times the amount retained by absorption oil under these conditions. At 40 psia., or about 25 psig., the amount held by carbon is 25 times that held by oil. For ethane at 40 psia. 11.4 times as much is held by carbon as by oil; for propane, nearly 4 times as much is recovered by carbon (pound of hydrocarbon per pound of adsorbent). Low requirements for heating, cooling, and handling of the small amounts of carbon also are pointed cut as advantages in the economics of the process.

The principal column of the Hypersorption unit at the Midland, Mich., plant of Dow Chemical Co. includes two main heat-transfer sections made up of tubes set vertically in shell exchangers. Below the cooling section at the top of the column are an ad-

Fig. 2—Flow diagram of Hypersorption process when operating on natural gas to recover ethane, propane, and other hydrocarbons



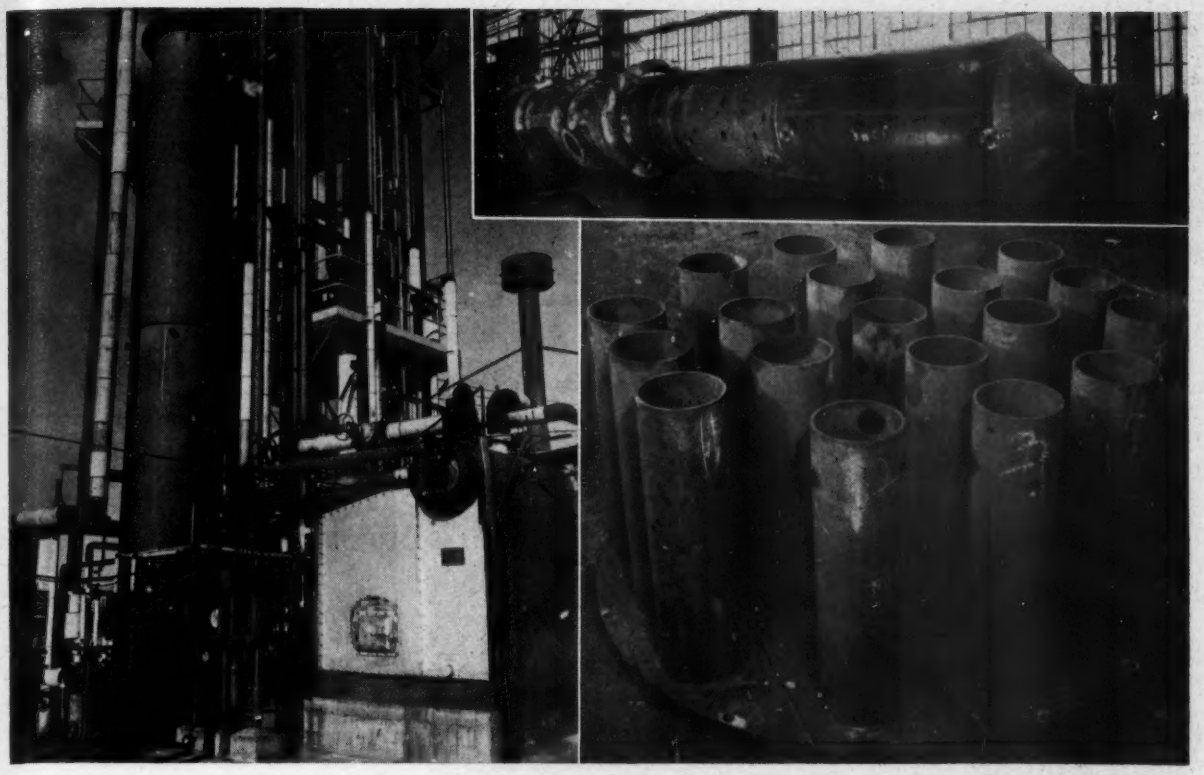


Fig. 3—(Left) Photo of unit showing the Dowtherm boiler (lower right), in which the heat-transfer medium, Dowtherm, is employed to add heat to the components under process. Fig. 4A—(Above, right) Details of main Hypersorber tower later installed at Dow Chemical's plant. Showing at left are the three "bustle pipe" rings. The nearest ring is the overhead product line, the middle ring is the charge gas inlet line, and the farthest ring takes off the bottoms product. These rings provide even distribution of inlet charge and removal of product from several points around the tower at the given level. Fig. 4B—(Right, lower) Engaging or disengaging section of tower. The absorber carbon flows through these down-extending pipes. The space around the pipe is left free of carbon, and into this space the charge gas may be introduced or the product gas withdrawn

sorption and a rectifying section which contain the inlet and outlet lines for the various gas streams. At the bottom of the column is placed a heating-stripping section.

The column is filled with a moving bed of granular, activated carbon, the upper level of the bed is in the hopper at the top of the column. This carbon bed moves slowly downward, passing first through the cooling section before entering the adsorption and rectifying sections. Then it passes to the stripper section for removal of the adsorbed hydrocarbons still remaining on the charcoal.

Feed gases enter through a distributor unit (see Figs. 4 A and B) at the bottom of the adsorption section, and pass upward countercurrent to the downflowing carbon. The unadsorbed gases exist from this section near its top, below the cooling section. Part of this stream is passed through the cooler as "purge gas" which serves to presaturate the carbon and to strip out any remaining water vapor. The remainder of the unadsorbed gas is withdrawn as lean gas or "discharge gas." The purge gas, after dehydrating the incoming carbon, is combined with the lift gas used in the charcoal lift-gas system. Charcoal "fines" are removed from this mixture, and the lift gas is recirculated while the purge gas is withdrawn.

The "fat" carbon carrying adsorbed hydrocarbons enters the rectifying section where it is met by a reflux of heavier material liberated in the stripper section below, which reflux drives off any adsorbed light material which may have been carried down on the carbon. In other modifications of the process, additional rectification sections are provided,

TABLE 1—MATERIAL BALANCES FOR OPERATIONS ON TWO RAW-GAS CHARGES

	Feed gas		Make gas		Discharge gas		Purge gas	
Component—	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %
Hydrogen	29,400	39.8	.....	.....	14,200	31.6	15,200	61.8
Nitrogen	1,240	1.7	.....	.....	630	1.4	610	2.5
Carbon monoxide	670	0.9	.....	.....	350	0.8	320	1.3
Oxygen	100	0.1	5	0.1	45	0.1	50	0.2
Methane	37,900	51.3	.....	.....	29,600	66.1	8,300	33.7
Carbon dioxide	150	0.2	130	2.9	.....	.....	20	0.1
Acetylene	160	0.2	160	3.6	.....	.....	.....	.....
Ethylene	4,250	5.8	4,150	92.7	.....	.....	100	0.4
Ethane	30	Trace	30	0.7	.....	.....	.....	.....
Total	73,900	100.0	4,475	100.0	44,825	100.0	24,600	100.0

TABLE 2—MATERIAL BALANCES FOR OPERATIONS ON TWO RAW-GAS CHARGES

	Feed gas		Make gas		Discharge gas		Purge gas	
Component—	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %	S.c.f./hr.	Vol. %
Hydrogen	24,800	37.2	.....	.....	15,300	32.3	9,500	64.0
Nitrogen	1,000	1.5	.....	.....	610	1.3	390	2.6
Carbon monoxide	670	1.0	.....	.....	460	1.0	210	1.4
Oxygen	130	0.2	.....	.....	100	0.2	30	0.2
Methane	35,600	53.2	5	0.1	30,900	65.2	4,695	31.4
Carbon dioxide	130	0.2	130	2.9	.....	.....	.....	.....
Acetylene	130	0.2	130	2.9	.....	.....	.....	.....
Ethylene	4,270	6.4	4,215	92.6	.....	.....	55	0.4
Ethane	70	0.1	70	1.5	.....	.....	.....	.....
Total	66,800	100.0	4,550	100.0	47,370	100.0	14,380	100.0

and one or more side cuts of high degrees of purities may be obtained.

The carbon leaving the rectification section passes downward and enters the stripping section, after passing a section used for disengaging the bottoms product, and the steaming section. Steam introduced below the stripper passes up through the tubes of the stripper section and into the steaming section, drives off the last of the adsorbed components, and is itself removed along with the material referred to as rich gas, make gas, or product gas.

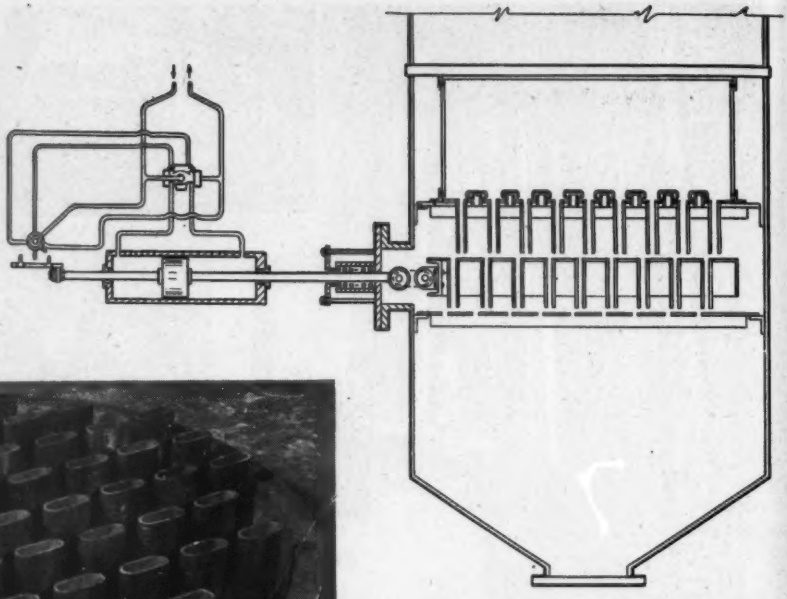


Fig. 5A—(Above) Drawing shows control of carbon flow achieved by the oscillating tray which carries the downflow pipes. Fig. 5B—(Left) Photo of the oscillating tray diagrammed in Fig. 5A

To reactivate the carbon if necessary, a unit is provided through which a portion of the carbon stream is bypassed and heated to remove the heaviest hydrocarbons which may remain residually on the carbon. The reactivated carbon is returned to the lift line at the bottom.

A specially designed feed system is installed in the bottom of the stripper section which controls positively the rate and uniformity of carbon flow down the column (see Figs. 5 A and B). From the bottom of the column the fresh carbon is transferred to the top of the column by the gas-lift operation and is dropped into the hopper to complete the carbon cycle.

A definite relationship exists between the hydrocarbon being adsorbed and the temperature of a given level of the carbon bed; unlike conventional fractional distillation, very sharp temperature breaks occur in the Hypersorption process. The control of separation in the bed utilizes this effect. For example, the flow of bottoms is controlled automatically from the abrupt break in the temperature in the rectifying section, between the feed inlet and the

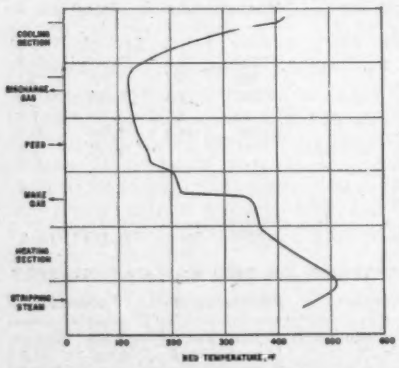


Fig. 6—(Above) Graph of the temperature gradient maintained in the various sections of the Hypersorber tower

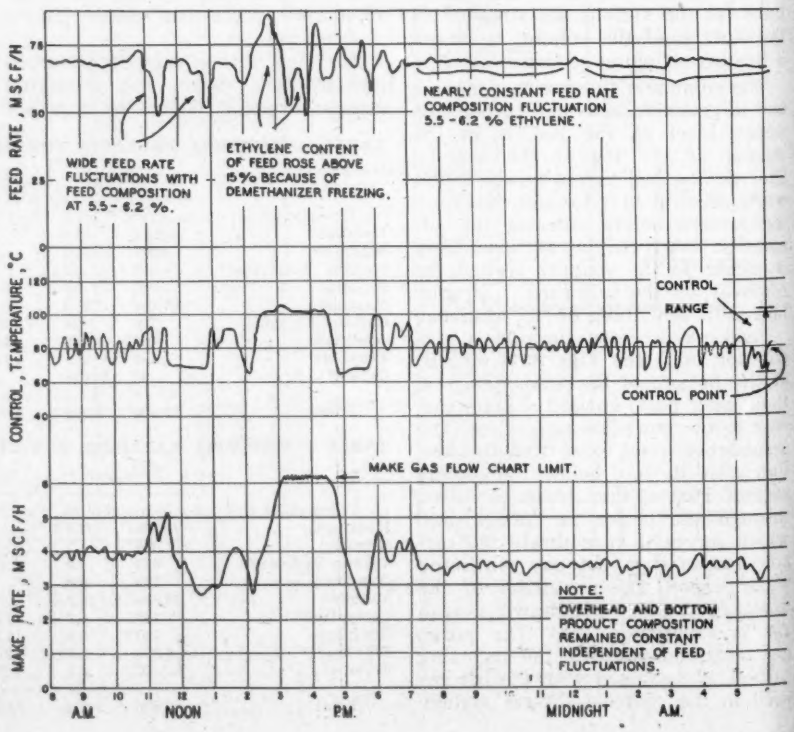


Fig. 7—(Right) Typical records of control performance of the Hypersorber under widely varying flow conditions

bottoms-product outlet where the reflux of heavier components is being adsorbed. The highest product purity is the goal set for commercial units; as the rate of carbon circulation drops below some given minimum the decrease in over-all percentage of product recovery is greater than the reduction in the consumption and therefore the cost of utilities required. It is desirable, thus, to operate at high separation efficiencies.

A highly important feature of the unit's design and operation is that of achieving control of solid flow; it is designed to permit practically vertical downflow travel with a minimum of channeling and flow-rate variation in different parts of the sections. Engaging and disengaging trays in the unit have a number of downspouts arranged in a geometric pattern to handle carbon in a uniform manner throughout the cross-section (see Fig. 4 B). To reduce the pressure drop in distributing gas across the feed-engaging and product-disengaging trays of large diameter a number of peripheral inlets and outlets are installed.

A carbon flow-control assembly includes a tray of circular cross-section to which an oscillating motion is given; at one end of the tray's travel the several downspouts with which it is fitted are in "register" with carbon inlet delivery tubes immediately above, but are closed at the bottom or outlet ends. The carbon drops from the inlets into these downspouts and is held therein until the tray reaches the opposite end of its "swing," when the downspouts are closed to the inlet tubes above but are open at the bottom for carbon to flow downward into the outlet tubes to the level below. In this manner the rate and uniformity of flow are controlled within relatively narrow limits.

The unit at Midland was designed to process a maximum of 1,800,000 cu. ft. of gas per day. It will circulate up to 32,000 lb. of carbon per hour and will strip the carbon at 500° F. or higher temperature. The Hypersorber tower is 4.5 ft. in diameter and 85 ft. high. A bin 4 ft. in diameter and 60 ft. high is used for carbon storage and intermittent make-up. Additional frameworks support the carbon reactivator, operating platforms, and other parts. The auxiliary equipment includes the lift-gas blower, product-gas cyclones, Dowtherm furnace, bottoms-product cooler, and knockout drums. Accompanying photos show several views of the completed unit and component parts.

In this unit for the recovery of ethylene from mixed gases the feed gas, containing 5-7 per cent and up to 40 per cent of hydrogen along with 90 per cent or more of methane with very small amounts of other light constituents, is fed to the unit at about 100° F., a pressure of about 75 psig., and at a rate of about 75,000 cu. ft. per hour, the design rate.

About 18,000 lb. of carbon is circulated per hour. Temperature of the carbon in the bed at the top of the absorption section is about 120° F. and increases to about 150° F. in the adsorption section, and to about 210° F. in the rectifying section where the ethylene reflux is adsorbed. Stripping heat is applied with Dowtherm vapor and the carbon reaches a maximum temperature of about 510° F. in the stripper. About 400 lb. of steam per hour is introduced below the feeder mechanism.

The utilities for the unit referred to, when operating under substantially the same conditions described above, amount to 1,360 lb. or 150-lb. steam per hour for stripping steam and the lift-gas blower turbine; 11 kw. of electric power for water booster pump, carbon feeder hydraulic pump, lighting, operation of instruments, etc.; and 12 man-hours of labor per 24-hour day. With a 20° F. temperature rise in the cooling water the following amounts of water are used: Hypersorber cooling section, 135 g.p.m.; bottoms product cooler, 55 g.p.m.; lift-gas blower seal, 2 g.p.m. Fuel gas for the Dowtherm vaporizer is consumed at a rate of 2,950 cu. ft. per hour for 900-B.t.u. gas.

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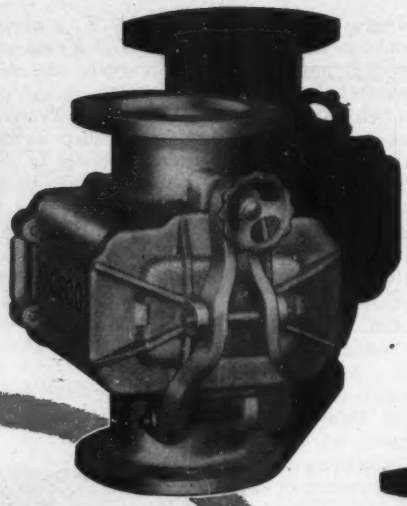

Oceco 6" Flame Arrestor Showing Flange Mounting and Bottom Hinge.

Below—View of Oceco Type "F" Fixed Bank.

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Above—View of Oceco Type "E" Extensible Bank.

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The carbon employed in this unit was an inexpensive war surplus stock known as "apricot pit carbon" and ranged from 12 to 30 mesh when new. Typical screen-size ranges were:

Retained by screen size (mesh)	Per cent retained
12	0.2
20	68.2
30	27.1
35	1.8
60	1.5
Through 60	1.2

The unit used 15,000 lb. of this carbon at its initial charge. After continued use, the average composition of fines—above 30 mesh—increased from a total of 4.5 per cent to an equilibrium value of about 20 per cent. Loss of carbon from this operation has averaged about 100 lb. per day which amounted to a total cost of $5 per day for the charcoal initially charged. No decrease in activity of the carbon has appeared after 7 months' use, and no reactivation has been necessary.

A harder and more active cocoanut-shell type of carbon will be employed for makeup in this and probably in other plants. Losses from the cocoanut-shell carbon, it is estimated, will be not more than one-fourth of that from the above apricot carbon. The process requires a highly active carbon, only that having adsorption values of 60-65 minutes, chloropicrin test, being recommended.

Typical results obtained in the above plant in the concentration and separation of ethylene are shown in Tables 1 and 2, along with the amounts of impurities in the ethylene fraction, and the loss of ethylene to the discharge and purge gases. It is noted that from a feed containing about 6 per cent ethylene, 98 to 99 per cent of the ethylene was recovered in a CO_2-free purity of about 95 per cent.

In operations for other purposes (such as the recovery of propane, etc., at the California plant of Union Oil Co., in pilot plants, and by calculation from experimental data obtained) in one instance, from a feed gas containing 2.9 per cent of propane and 0.3 per cent of butane the make gas contained 87 per cent of propane, 11.1 per cent of butane, and only 0.7 per cent of ethane. This represents a total recovery of 3.2 mols of hydrocarbons from 100 mols of charge stock.

In pilot-plant separation of hydrogen, from a charge containing 52.2 per cent H_2, 43.5 per cent methane, and small amounts of C_2 and C_3, the discharge has showed 100 per cent hydrogen, with 91 per cent of methane and practically no hydrogen in the make gas. Pilot-plant operations to concentrate propane show results of 99.2 per cent propane in the make gas, from charge containing 28.8 per

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cent of C_3, using "rectified side-cutting" operations for coincident recovery of a C_2 stream of similar high purity.

Control of the different variables in the process of a most important phase of the operation; in the hypersorber column the separation is controlled by basing it on the abrupt temperature "break" in the rectifier section caused by the adsorption of the nearly pure ethylene sent up from the stripper section as reflux. Most of the reflux adsorption takes place, the designers say, in a relatively short (vertical) length of the carbon bed, which gives a sharp temperature gradient in that section. Controlling the amount of ethylene reflux at the required value maintains this gradient at a point immediately below the feed inlet; control of the reflux is accomplished by controlling the bottom-product withdrawal rate. A controller is set at the midpoint of the temperature gradient, which resets a flow controller in the bottoms-product line, to control entire tower's main operations.

This method is reported to show remarkable uniformity of product through wide changes in throughput rate and feed composition. In one instance the feed rate jumped suddenly from 60 per cent of design to full design rate; the unit handled this situation for 2-3 hours without changing carbon circulation rate before ethylene showed in the overhead gases. In another case, the ethylene concentration of the feed jumped nearly 400 per cent, to 23 per cent of the total gas. This was for 2 hours, until the feed composition changed back to "normal," but meanwhile the product streams compositions did not change.

One of the important recent developments is that of using a construction which includes rectification of the side stream, by which a side cut of purity equal to that of the main product is obtained. Also, a multiple feed inlet system may be used, to reduce the diameter of the column, when separating components which are in small concentration in the feed stock.

Designers of this process find that it permits close separation of many products in high degree of purity, it being a fundamental "vapor-phase separation process" wide in its adaptability. They report, for example, that ethylene may be separated as a side cut, propane and heavier in the bottoms, and hydrogen-methane as overhead gas. Acetylene may be recovered from oxidation or electrical discharge units. In natural-gasoline and L.P.G. recovery, methane and ethane may be sent overhead, propane taken off as a side cut, and butane as the bottoms product. Hydrogen may be segregated economically from reaction gas mixtures.

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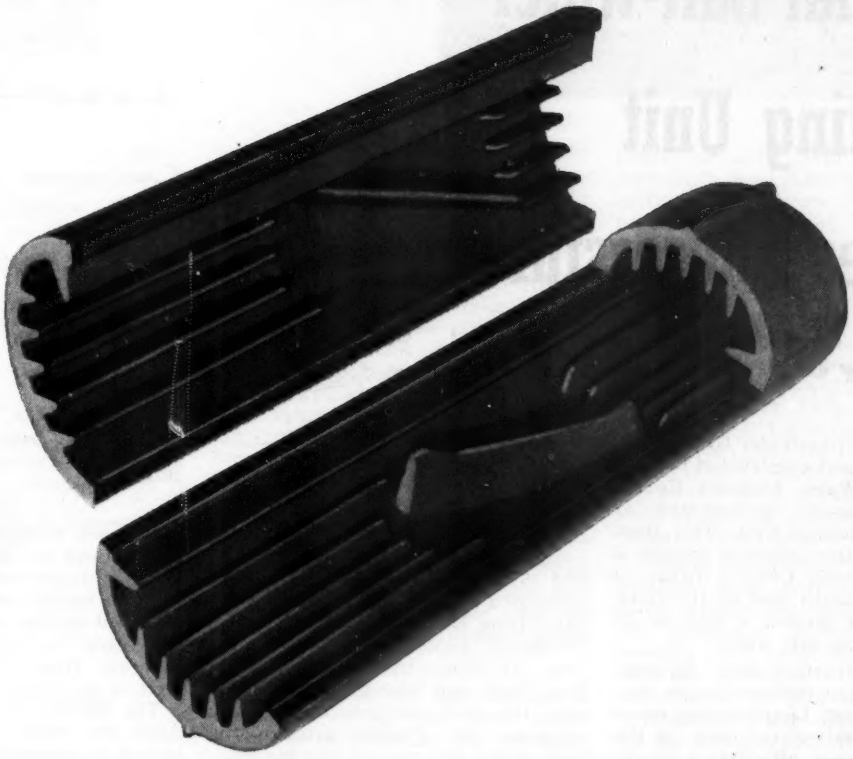

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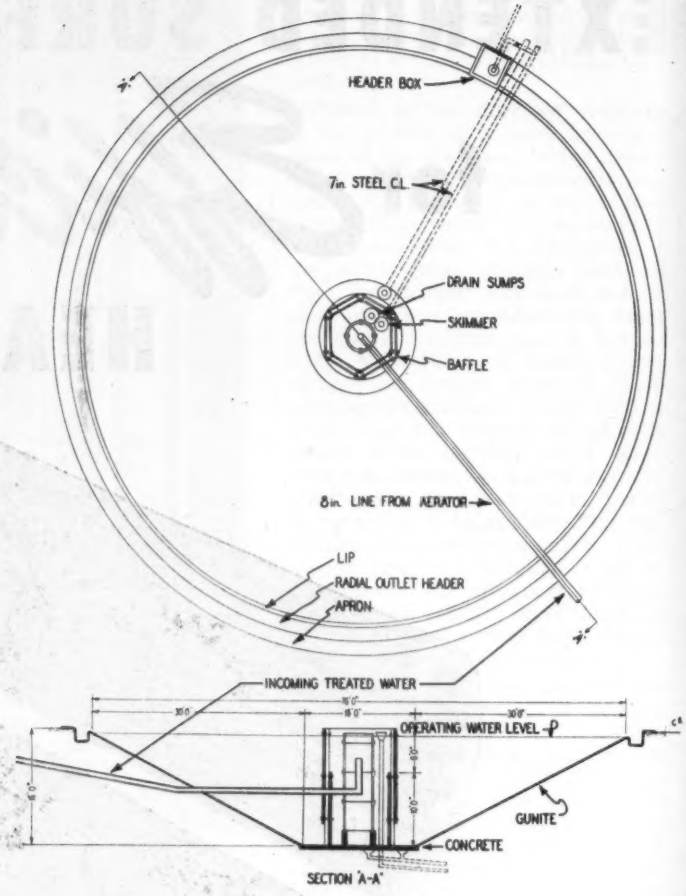
Fig. 1—Design of the circular treating pit showing construction details in plan and elevation. Treated salt water enters the pit at the center and passes to the settling section of the basin through baffles to eliminate turbulence. At present throughput rates, approximately 24 hours are provided for the settling of solids to the sides of the basin. When necessary, cleaning will be simple, flushing the slopes to the central sumps which empty to a lower cleaning pit at the base of the hill



Circular Salt-Water Treating Unit Proves Successful

by George Weber

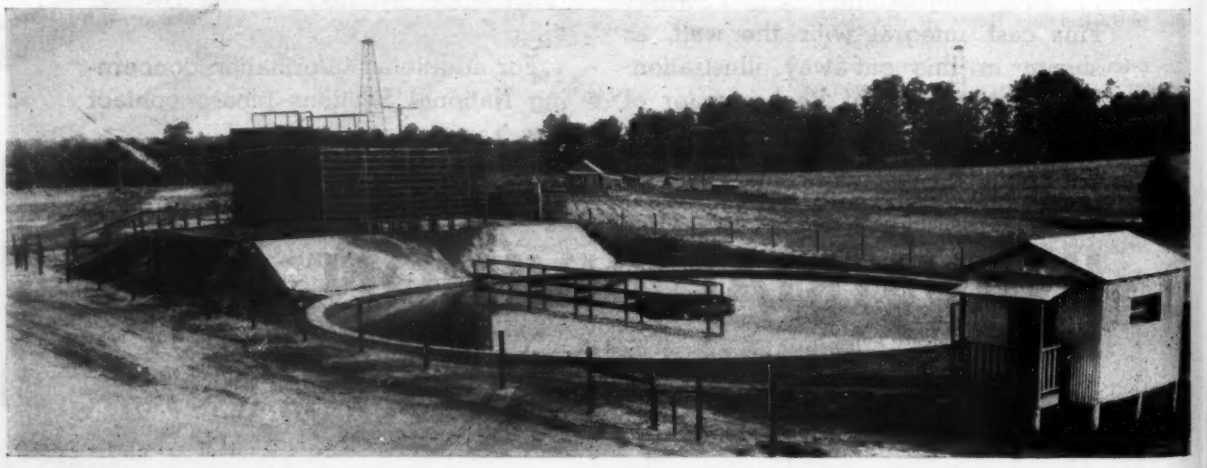
A NEW type of circular treating pit, designed and constructed by East Texas Salt Water Disposal Co., is giving satisfactory performance at the C. V. Millikan Unit. This most recently installed injection system is located in Upshur County, Texas, in the extreme north end of the field, and serves at present a total of 22 wells producing salt water.

The new departure from the conventional design replaces larger rectangular settling basins employed in most of the salt-water units in the field. It is deeper, affording a slower initial radial flow from the center to the rim. As shown in Fig. 1, the basin comprises a center section 15 ft. deep and 16 ft. in diameter. The sides are excavated to a slope of approximately 26½° from horizontal.

Treated water from the aerator (Fig. 2) enters the pit through an 8-in. line, and plumes forward inside the 4-ft. column of concrete drainage tile. Passing through the base of this column and into the octagonal redwood riser, the water moves downward through baffles to enter the settling pit proper at an elevation 3 ft. from bottom. Moving slowly to the rim of the pit, the water is collected in the radial outlet header and flows by gravity through the pressure filters near the injection well, a downhill distance of 560 ft.

The pit has a capacity of nearly 5,000 bbl. Since the unit was first placed in operation on April 23, 1948, throughput has averaged 4,200 bbl.

Fig. 2—Salt water from producing leases is pumped to the elevated skim tank at the left, and after chemical treatment, is aerated in the open tower and moved directly to the pit. Chemical pump is located in the dog house, right



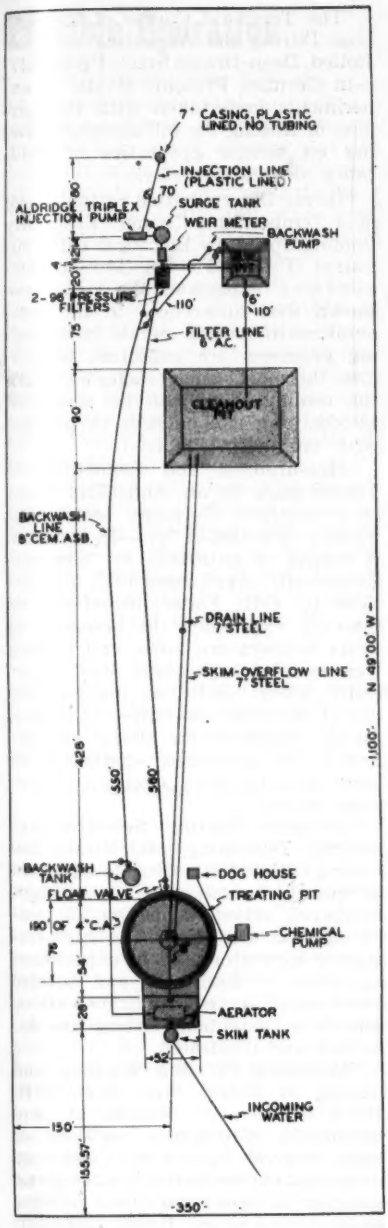


Fig. 4—(Left) This over-all plant layout shows the provisions for gravity flow from the skim tank to the injection well, and the facilities for draining treating pit and backwashing filters

Fig. 3—(Right) Pit excavation was relatively simple, using a drag-line which circled the site. Visible in the center of the basin is the central concrete tile column where salt water enters the pit. Downhill in the background is the injection well

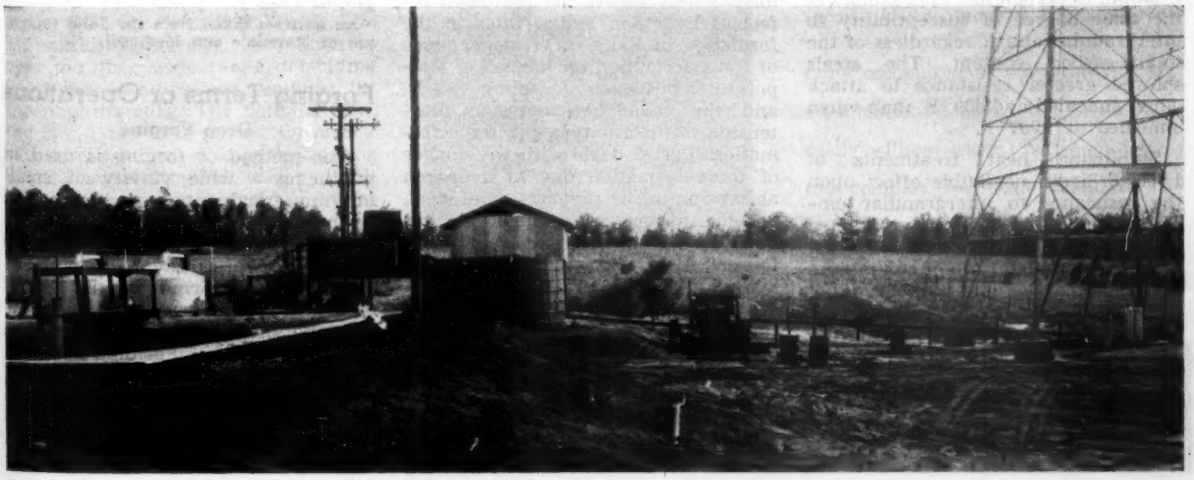
daily, allowing a settling time in excess of 24 hours. Previous experience with settling tanks in the field indicates that the pit will satisfactorily handle a much greater volume in the future.

Pit construction was relatively simple. Excavation was done with a drag-line, circling the site (Fig. 3). After underground feed and rain lines were laid, the pit was graded and the center floor section poured. Steel reinforcing mesh was laid on the slope and shaped at the edge to form the lip, header, and apron. Gunite concrete was then applied over-all. The lip, or overflow rim was laid thick, then troweled to proper elevation with the use of a surveyor's level. This method proved sufficiently accurate to provide a uniform spill around the pit's circumference.

As in other East Texas installations, this plant takes advantage of natural topography to provide gravity flow wherever possible (Fig. 4). The skim tank, settling pit, and aerator are located at sufficient elevation to provide gravity flow through the entire plant to the surge tank located downstream from the filters and weir meter (Fig. 5). Water is injected into the plastic lined casing of the input well. A triplex pump is used when pressure is required.

Design of the circular settling pit resulted from previous success in using a 2,000-bbl. redwood tank at the company's Warren unit. The treating tank, provided with central baffling, successfully handled daily volumes up to 7,500 bbl. A similar redwood tank was originally planned for the Millikan unit. When materials were unavailable, the circular concrete pit was designed and proved to be less expensive.

Fig. 5—(Below) At the input-well location are shown, left to right: filters, located beyond the backwash pit, the weir meter, the surge tank, beyond it the triplex pump house, and at the extreme right, the injection well



PROGRESS IN METALS

by W. L. Nelson
Consulting Engineer

Stabilization of Austenitic Stainless Steels

AUSTENITIC stainless steels of the 18:8 type are particularly susceptible to intergranular corrosion if subjected to moderately elevated temperatures in the range of 700° to 1,400° F.—and then are either simultaneously or subsequently subjected to corrosive conditions. Experience has shown that the steels may be stabilized against intergranular embrittlement by the addition of titanium or columbium, usually in conjunction with a stabilizing heat treatment.

A diversity of opinion has existed, however, as to the relative amounts of titanium or columbium necessary, the injurious effect of carbon content, and the necessity for stabilizing heat treatments. The National Bureau of Standards has set out to study the factors affecting the stabilization of the 18:8 type of steels, and a technical account of the work is given in the Journal of Research, April 1948, by J. S. Rosenberg and J. H. Dorr.

Considering the steels which contained no stabilizing elements, the tests showed that all were vulnerable to intergranular attack. Decrease in carbon content, however, decreased the degree of vulnerability.

In columbium and titanium-bearing steels, carbon content within the range of 0.06 to 0.13 per cent had no influence upon the resistance to intergranular attack except as it influenced the ratios of columbium to carbon or titanium to carbon. Steels varying in carbon content but having similar ratios of either columbium or titanium to carbon had approximately the same degree of susceptibility to intergranular attack regardless of the total carbon content. The steels showed greater resistance to attack when annealed at 1,800° F. than when annealed at 1,957° F.

Stabilizing heat treatments at 1,600° F. had a negligible effect upon the resistance to intergranular embrittlement of the columbium-treated steels so that these steels carrying a sufficiently high ratio of columbium to carbon may be used without giving them a stabilizing heat treatment. However, the performance of the titanium-treated steels carrying the higher ratios of titanium to carbon were markedly improved by such treatments.

An abstract from the June 1948 issue of Materials & Methods.

Developments in Heat Treatment During the War

SIGNIFICANT findings of American and German wartime research and experience in heat treatment of steel and steel alloys are contained in nine reports just issued by the Office of Technical Services, Department of Commerce. They are listed briefly below:

"Corrosion Resistance of Annealed Versus Embrittled 27 Per Cent Chromium-Iron Alloy in Boiling 65 Per Cent Nitric Acid (PB-62829)"—Alloys of 27 per cent chromium with iron studied for resistance to boiling 65 per cent nitric acid when in the annealed state.

"The Effect of Temperature Upon the Hardness of Croloy 27 (PB-62853)"—Describes temperature-gradient test conducted for the purpose of determining accurately the temperature range that will affect the physical properties of Croloy 27. The test was conducted for 400 hours, in which time the test bar was subject to gradually decreasing temperatures from 1,570° to 380° F.

"Effect of Long-Time Heating on Hardness and Structure of 27 Per Cent Chromium-Iron Alloys as Determined by the Gradient Bar Heating Test (PB-62830)"—Describes temperature-gradient tests. The tests reported were conducted on identical specimen material for 1,000 and 1,600 hours.

German Reports

"Absorption of Hydrogen During the Annealing Process, Its Influence on the Formation of Flakes and Brittleness (PB-64725)"—Written in German. Part I covers the combined effect of hydrogen and stresses in the formation of flaky flaws, dependence of flake formation on annealing temperature, influence of cooling speeds, and the connection between martensitic transformation and flake formation. Part 2 deals with the danger of flake formation due to hydrogen absorption in the preparation of steel, and the influence of segregations, impurities, and various hydrogen-containing gases. Part 3 covers impairing of expansion and reduction in area due to hydrogen annealing, changes in stability properties of unalloyed and low alloyed steels due to hydrogen absorption during annealing, properties of austenitic steel during annealing in hydrogen, and the behavior of hydrogen-containing steels at low temperatures.

"The Temporal Course of Strength Loss During the Annealing of Cold-Rolled, Deep-Drawn Steel (PB-65051)"—In German. Presents results of experiments undertaken with the purpose of finding the influence of glowing on tensile properties of cold-rolled, deep-drawn steel.

"Direct Determination of the Speed of a Temperature Change, Especially Cooling Speed, by Electrical Differentiation (PB-65099)"—In German. Describes experiments which have shown that differences in the temperature in cooling metals in annealing processes are sufficient to produce thermoelectric voltages by which the cooling speed can be measured by charging a condenser in parallel with the thermocouple.

"Measurement and Regulation of Temperature in an Annealing Plant of a Southern Germany Instrument Factory (PB-4600-S 70)"—In German. A reprint of an article in "Siemens-Zeitschrift," April-June 1942. The article, by Fritz Faller, introduces its topic by explaining the necessity of exact temperature, time, and cooling treatment of high-grade steel, especially when conditions prevent the use of desirable quantities of critical metals (tungsten) for alloys; and describes the annealing equipment as used in a German precision instrument factory.

"Induction Heating: Selective Annealing, Tempering, and Strain Relieving (PB-49265)"—Briefly and nontechnically discusses the use of high-frequency induction heating for tempering and annealing. The high-frequency converter used in experimental work is described, and several cases which serve to indicate various aspects of induction heating are described and illustrated.

"Annealing, Pickling, Washing, and Liming of Rolled Steel Wire (PB-44662)"—Discusses economical and technically satisfactory methods of scale removal from wire. Control of sulfur and carbon in the furnace gases, selection of most satisfactory pickling methods, and proper liming and elimination of hydrogen brittleness are emphasized.

An abstract taken from the June 1947 issue of Materials and Methods.

Forging Terms or Operations

Drop Forging

This method of forging is used in producing a wide variety of small unsymmetrical items such as wrenches, the forming of which involves shaping the surface as well as producing a profile.

The metal is formed by the impact of a falling hammer. Both the hammer and the anvil are usually fitted with special dies. Forming is often accomplished in several succeeding steps, and several recesses are sometimes cut into the same dies. Drop hammers, board hammers, or steam drop hammers are employed.

Flexible Operation

(Continued from page 80)

of the oil is converted to hydrogen sulfide gas which is removed in the fractionating tower, passing out the top with other noncondensable gases. This tower is also considered the No. 1 tower of the naphtha unit, since it accomplishes the initial separation in the series of cascaded towers.

As shown in the schematic diagram, the charge stock "X" is passed through two parallel coils in a vertical heater, the flow through each pass being regulated by recording electric flow meters with pneumatic control. An electronic pneumatic controller (range 600°-1,100° F.) controls the outlet oil temperature.

Compressed air mixed with the superheated steam is used to regenerate the catalyst periodically. One chamber can be regenerated while the other is processing, if desired. During the regeneration, the ratio of steam and air is held constant by separate flow controllers at a value to provide the desired rate of burning in the chamber. The superheated steam is produced by a vertical heater with the outlet temperature maintained by an electronic pneumatic controller.

Temperature Recording

Inlet and outlet pressures of the oil to and from the catalyst chambers are recorded on two-pen pressure gages (range 0-100 psi.), indicating by this differential pressure, the condition of the catalyst beds. Critical operating temperatures throughout the catalyst bed are recorded by 12-point strip-chart electronic potentiometers (range 600°-1,800° F.) with thermocouples installed through the chamber walls, as shown in the accompanying photograph.

As is the case for each column in the naphtha unit, the No. 1 fractionator utilizes two electronic pneumatic temperature controllers: one measuring the tower overhead and regulating the reflux; the other measuring the temperature about midpoint in the tower and controlling the reboiler heat input ("Z" as described later). The set point of either electronic is varied over a rather wide range depending upon the specifications required for the naphtha cuts. The bottoms from the No. 1 tower is passed through a caustic wash and a copper treating unit to remove the last traces of sulfur and forms the charge "Y" to the No. 2 naphtha tower.

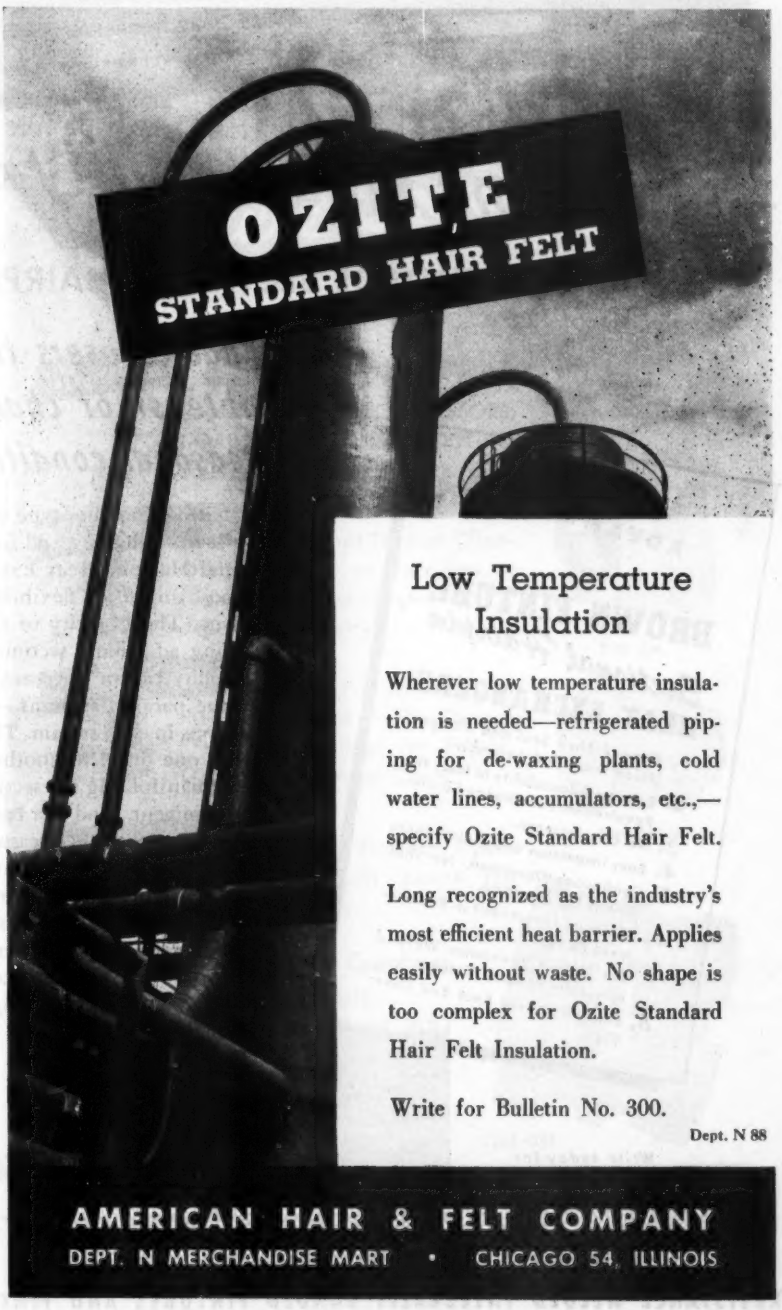
Overhead product of the No. 1 tower is drawn from the reflux drum at a rate determined by the level controller, whence it is fed to a stabilizer column. Temperature in this column is under the supervision of an electronic pneumatic controller, while overhead reflux is held constant by a flow controller. Bottoms from the stabilizer constitutes gasoline or light naphtha.

Temperature points connected to the central reading precision indicator in the desulfurization unit include:

1. No. 1 fractionator—tower top, inlet, bottoms, overhead condenser outlet, bottoms cooler (not shown) inlet and outlet.
2. Stabilizer reboiler oil outlet, as well as top and bottoms.
3. Steam superheater firebox, steam outlet, and steam-air mixture to catalyst chamber.
4. Desulfurizer heater firebox, stack, separate inlet and outlet oil from the two coils, as well as the combined outlet and also effluent oil from heat exchanger.
5. Catalyst chamber—check on recorded temperatures of 11 zones in each chamber and the vapor outlets.

As shown in the schematic diagram, the five columns of the naphtha unit are normally arranged with the bottoms from one tower forming the feed of the next. Consecutively higher boiling-point components with relatively narrow distillation ranges are obtained in each successive tower. The columns (illustrated) are approximately 3 ft. in diameter and 70 ft. high with Koch Engineering Co. cascade-type fractionating trays to accomplish the desired separation.

The essential instrumentation of the naphtha unit is given on the accompanying schematic diagram. Feed "Y"



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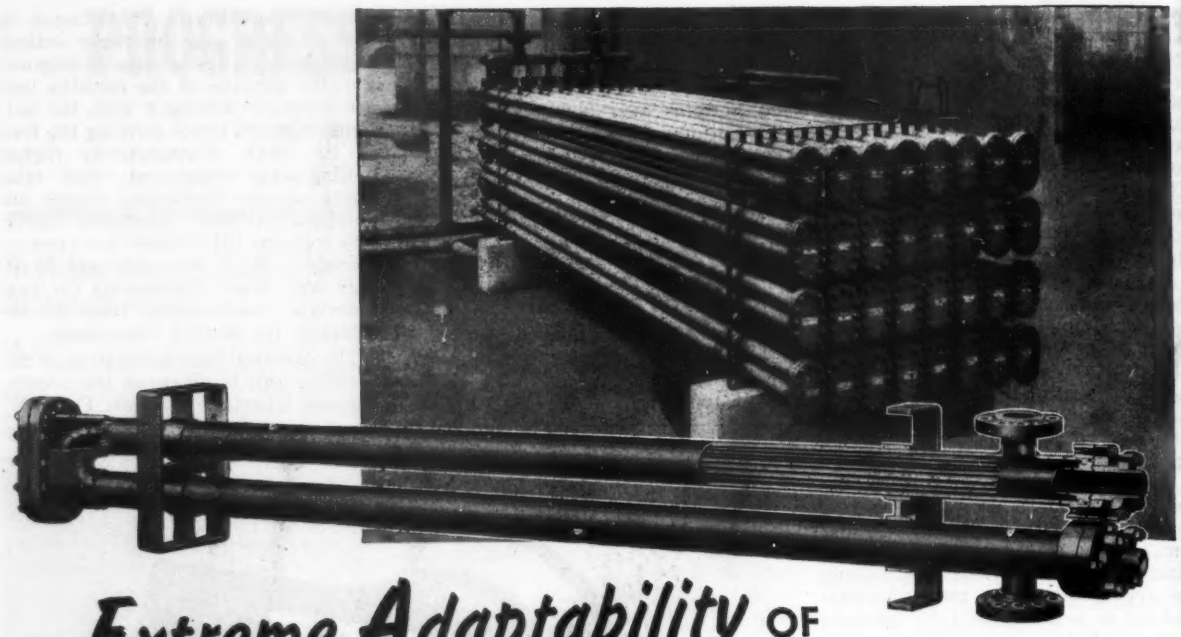

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to the No. 2 tower is flow controlled while all other process flows are regulated from temperature, level and pressure. Two electronic pneumatic controllers maintain the overhead and tower temperatures in the same manner previously described for the No. 1 fractionator; bottom outlets are regulated by level controllers; and naphtha cuts are withdrawn from the reflux accumulators in accordance with the dictates of recording pressure controllers, as shown.

Heat is supplied to the tower reboilers from a gas-oil heater with recirculating lines, as shown. An electronic controller (range 300°-800° F.) regulates the heater outlet oil temperature and a flow controller maintains a constant return oil flow to the heater. Heat input to towers No. 2, 3, and 4, is throttled by a diaphragm motor valve on the hot-oil outlet line; towers No. 5 and 6 utilize a three-way diverting valve.

The reboiler piping system is arranged as shown because the No. 5 and 6 towers require the hottest oil and, hence, all the oil is heated to the temperature required by these towers. If the oil flow to all towers were in parallel, more oil would have to be heated to this high temperature. However, by the use of three-way valves on the last two towers and by running the oil first to these towers, the remaining heat can be utilized in the cooler towers, passing entirely through the reboilers to towers No. 5 and No. 6, if necessary.

In order to accommodate the varying requirements for reboiler oil in each tower, a differential pressure controller (DRC) is connected across the supply and return lines of the circulated oil to operate a valve in a bypass line, as shown.

Precision indicator temperature points in the naphtha unit include:

1. Each tower top, inlet, bottoms, and overhead condenser outlet.
2. Reboiler oil heater firebox, stack, and oil outlet.
3. Reboiler oil accumulator.

Although the usual process flows are as illustrated, there is actually no "normal" operation, because the variety of naphtha specifications requires an equivalent flexibility in operating conditions. Alterations in these conditions are facilitated by interlocked connections of controlled air lines from the diaphragm motor valves to several control instruments, with manual transfer valves in the air lines to switch operation of a valve from one instrument to the other. An example of such an interlock, utilizing a four-way air transfer switch, is illustrated in the accompanying schematic diagram and described below.

When the naphtha units are running "normally," the three tower level controllers for No. 1, No. 2, and No. 6 position their respective valves on the bottoms outlets. For this operation, the four-way transfer valve is switched to connect No. 1 level controller with its valve (solid lines in four-way valve); hand valve "A" is open and "B" closed, so that No. 2 and No. 6 controllers also operate their respective valves.

When the naphtha unit is run for reforming (making gasoline), it is desired to have No. 1 tower level controller position No. 6 outlet valve and No. 2 controller position No. 1 outlet valve with No. 2 valve inactive in the system. This is provided by switching the four-way valve to its second position (shown dotted), closing valve "A," and opening valve "B." The No. 1 tower bottoms are then sent to storage as polymers which, on naphtha operation, are obtained from the No. 6 tower. Similarly, the No. 2 tower bottoms go to a treater which, on naphtha operation handles the bottom stream from the No. 1 tower. The No. 6 tower is not used. In conjunction with the operation of the air switch, of course, provision is made for manual diversion of product flows upstream from the respective control valves.

Acknowledgment

The author wishes to acknowledge the helpful cooperation of J. Foster and T. J. Williams, superintendent of R.O.C. refinery, who gave freely of their time and knowledge to make this article possible.

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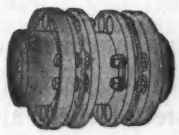
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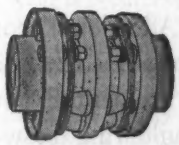
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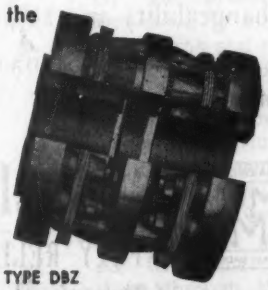
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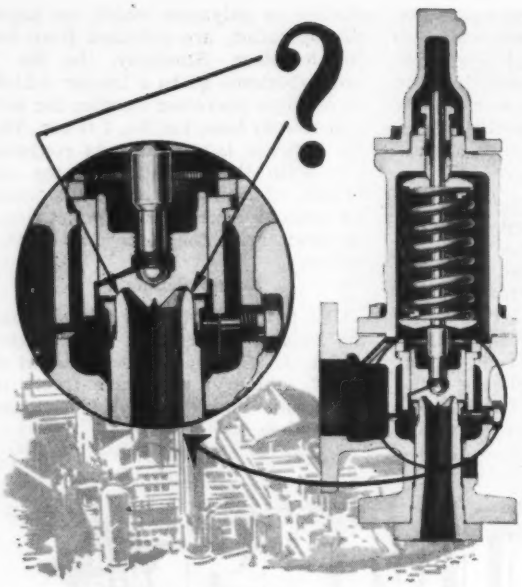

Why the *Outside* Bevel Seat?

The Outside Bevel Seat and Floating Guide construction supplied only in CONSOLIDATED Safety Relief Valves provides the *flexibility* which eliminates leakage despite bolting strains and discharge piping stresses.

The outside bevel seat permits movement of the disc on a radial seating surface and assures tightness in all positions within the deflection range.

Additional CONSOLIDATED features include fixed *built-in* capacity which cannot be accidentally altered during maintenance, single ring blow-down control, and simplicity of design with maximum interchangeability and 25% fewer parts.

Specify CONSOLIDATED for maximum safety.

MAXWELL MANNING MM & MOORE INC. TRADE MARK

CONSOLIDATED

1879 CONSOLIDATED U.S.A.

SAFETY RELIEF VALVES

A Product of

MANNING, MAXWELL & MOORE, INC.

TULSA, OKLAHOMA

Makers of Consolidated Safety and Relief Valves, 'American' Industrial Instruments, Hancock Valves, Ashcroft Gauges. Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists, and other lifting specialties.

UNITED

Electric

Controls

Company

UNITED BLAST-PROOF CONTROLS PROTECT COSTLY EQUIPMENT

TYPE EJR
CLOSE DIFFERENTIAL
PRESSURE CONTROL

TYPE EJO
THERMOSTAT

TYPE EGL PRESSURE SWITCH

All three of these electric controls are especially designed for use on processing equipment, storage tanks, diesel engines and similar industrial applications where dangerous fumes are prevalent. All have approved blast-proof housings, tapped for electrical connections, that may be mounted in any position on a flat surface. The EJO, a remote bulb type, ambient compensated thermostat with a calibrated external adjustment knob, is especially valuable for Pilot Duty temperature control of liquids or gases. The EJR and the EGL are close-differential pressure-vacuum switches for closely controlling air, gas or liquid pressures.

FOR COMPLETE DETAILS WRITE: Dept. O, 69-71 A STREET, BOSTON, MASS.

Standard & Special Thermostats & Pressure Switches

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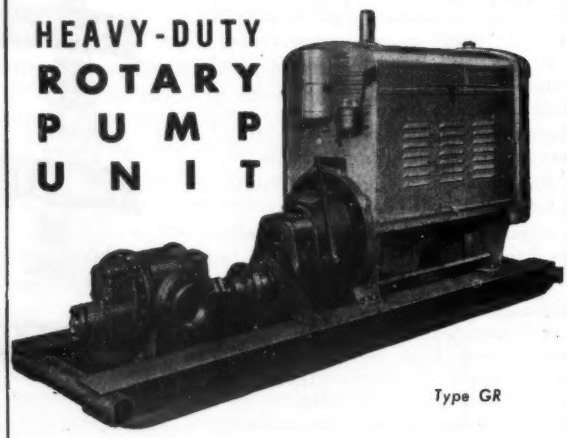
HEAVY-DUTY
ROTARY
PUMP
UNIT



Type GR

LOCKETT Dealers — from warehouses located at, or near the principal oil fields of Texas and Louisiana — can supply Worthington Pumps to meet every pumping need.

Worthington Pumps are adaptable for use with any power unit — gas, gasoline, Diesel, or electric motor of any type or manufacture.

Lockett Dealers can also promptly supply, from warehouse stock, *genuine* Worthington Repair Parts. We also carry a large replenishing stock of Worthington Pumps and *genuine* Worthington Repair Parts at our Houston and New Orleans Warehouses. For dependable, efficient service, let a Lockett Dealer supply your pump-equipment needs.

A. M. LOCKETT & COMPANY, LTD.

NEW ORLEANS HOUSTON DALLAS

ENGINEERING fundamentals

Producing Gas-Oil-Ratio Equation

AN equation frequently used in reservoir analysis and in the prediction of future behavior is one which gives the producing gas-oil ratio in terms of the pressure and saturation of the reservoir at the desired time. The equation is written as:

$$R = \frac{k_g}{k_o}\frac{\mu_o}{\mu_g}\frac{\beta}{v} + r \qquad (1)$$

where

- R = current producing gas-oil ratio, standard cubic feet per barrel of stock tank oil.
- μ_o = reservoir oil viscosity at the current pressure in centipoises.
- μ_g = reservoir gas viscosity at the current pressure in centipoises.
- β = formation volume factor at the current pressure.
- v = factor to convert standard cubic feet of gas to barrels of reservoir gas at the current pressure.
- r = gas in solution at the current pressure expressed as standard cubic feet per stock-tank barrel.
- k_g/k_o = relative permeability ratio of gas to oil at the current reservoir oil saturation, S_o.

According to the above equation the producing gas-oil ratio is seen to be a function of reservoir pressure and reservoir saturation.

It is of interest to note the derivation of this equation in order better to understand the limitations and assumptions involved. Consider a radial flow system, and an increment of dr thickness within the system (refer to Fig. 1). At this radius, the pressure of the reservoir is P and the pressure gradient is dp/dr. It will furthermore be assumed that the pressure gradient is the same through the gas phase and through the oil phase. There are q_o barrels of reservoir oil per day flowing past the radius r and q_g barrels of reservoir gas per day flowing past the radius r.

Darcy's law can be used to express the flow of either the oil or the gas. For the former:

$$v_o = \frac{q_o}{2\pi rh} = \frac{-7.07\, k_o\, dp}{2\pi\, \mu_o\, dr} \qquad (2)$$

and for the latter:

$$v_g = \frac{q_g}{2\pi rh} = \frac{-7.07\, k_g\, dp}{2\pi\, \mu\, dr} \qquad (3)$$

where v_o and v_g are the apparent velocities of reservoir oil and gas at r, and $7.07/2\pi$ is a conversion factor to allow rates to be expressed in barrels per day and dp/dr in pounds per square inch per foot.

Now the stock-tank oil produced per day (Q_o) will be equivalent to the rate of reservoir oil movement divided by the formation volume factor, or:

$$Q_o = \frac{q_o}{\beta} \qquad (4)$$

The standard cubic feet of gas produced per day (Q_g) will be equal to the rate of movement of reservoir gas converted to surface conditions plus the gas which is evolved from the oil produced, or:

$$Q_g = \frac{q_g}{v} + rQ_o \qquad (5)$$

The producing gas-oil ratio is by definition, however, the quotient Q_g/Q_o. Dividing Equation 5 by Equation 4, therefore, and substituting Equations 2 and 3 gives:

$$R = \frac{q_g\,\beta}{q_o\,v} + r = \frac{k_g\,\mu_o\,\beta}{k_o\,\mu_g\,v} + r$$

which is the equation first given.

The quantities in this equation were evaluated at the conditions of pressure and temperature existent at radius r. This is not a measurable quantity. Only an average pressure for such a well system can be measured by shutting in the well. However, if the value of ΔP across the system shown in Fig. 1 approached zero as a limit, one value of P would suffice to define the whole system. This would be the average reservoir pressure. In using Equation 1, therefore, as a reservoir equation in which β, v, r, μ_o/μ_g are defined by the average reservoir pressure, it is assumed that production is occurring at zero pressure differential.

To summarize, the assumptions that are tacitly involved in the use of Equation 1 are that (1) the pressure drawdown is zero, (2) the gas and oil are uniformly distributed and are flowing according to the equilibrium relative permeability concept, and (3) the pressure gradients in the gas are the same as those through the oil phase.

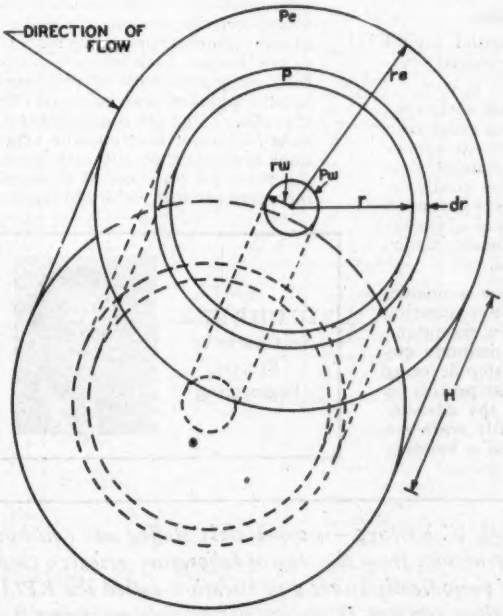
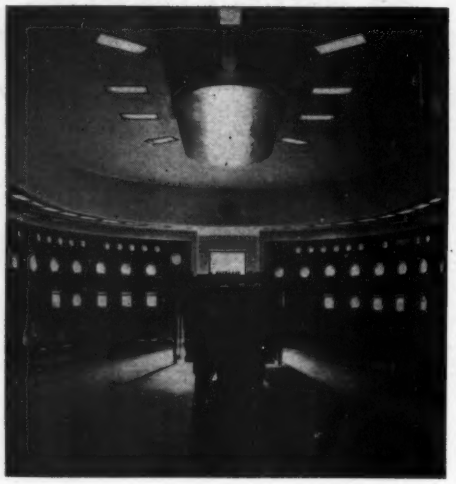


Fig. 1

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

No. 2 in a series

Process engineering under the "Master" Contract



THE basic step in all refinery expansion or modernization is, of course, process engineering. And it is in this first step that the so-called "master" type of contract – under which one engineering company takes complete responsibility for all work at any particular job site – starts paying dividends to any refiner.

In the opening advertisement of this series two definite advantages of the "master" contract were disclosed to lie in the process engineering phase:

1. *Concentration of overall process responsibility*

   . . . with consequent increase of efficiency of final plant and more profitable employment of refiner's own staff

2. *Integrated process planning*

   . . . providing actual initial capital savings and continued improved operation efficiency

With regard to the first of these advantages, a simple review of what goes on under alternate methods of placing contracts appears to offer sufficient proof. For example, a refiner's engineering staff must originally decide on the general plan for any expansion or modernization—based on its own intimate knowledge of the company's current situation and its future marketing plans.

To do this, even the largest companies customarily call in outside engineering counsel. For, with very few exceptions, refiners cannot afford to maintain specialists in every refining step devoting themselves to a particular process on a full-time basis. Since the advisory engineers called in usually work for companies whose business is building refineries—and since they quite naturally desire their company to get the lion's share of the forthcoming order—a "promotion" of varying processes and methods usually ensues.

As a result, instead of being faced with the calm evaluation of engineering principles and the comparative economics of alternative processing plans, the refiner's staff becomes involved in refereeing the claims of rival engineering experts—arriving, all too often, at a processing sequence that represents a compromise of conflicting opinions.

By contrast, the "master" contract method of operation is simplicity itself. One engineering contractor—*who can afford to* and *does* employ full-time specialists in every phase of processing—provides the refiner's staff with as many alternate processing sequences as are desired. Each of these plans is fully integrated—with all engineering factors included and balanced. Thus the *refiner's* staff can concentrate on its most important function—the expeditious evaluation of alternate processing plans *on the basis of economics*, including product yields and qualities, operating costs, maintenance costs, marketing requirements and crude supply, both present and future.

by
LUTHER HILL
In Charge of
Process
Engineering

The second stated advantage is a natural outgrowth of the first. It is safe to say that just two of the many "plus" factors present under the "master" contract operation would justify its adoption—namely (1) the uniformity of processing tolerances in all units embraced in the overall plan and (2) the saving in engineering man-hours generally wasted under alternative methods in checking processing details between the refiner and several engineering contractors and vice versa.

The purchase of useless excess reserve capacity in one or more units of a series is automatically precluded while at the same time the ability to operate all units efficiently at maximum output levels is achieved. The saving in engineering man-hours is not only of actual dollars but more important, of *time*, which results in units going on stream earlier – with consequent increase in refiner's income.

There are, of course, many other advantages of integrated process planning by one company which can be discerned in the centralization of controls, the integration of heat balances and efficiencies, and the steps taken to insure continuity of processing.

But beyond these details, monetarily important as they are, is the overpowering logic that under the master-type contract, a refiner makes a more valuable tool of his engineering staff—for he automatically relieves it of engineering detail and allows it to concentrate on the all-important matter of making the most money for him.

Our company—M. W. Kellogg—is completely staffed and equipped for refinery and chemical plant design and construction, from the step of laboratory research through the initial operation of completed plants. It periodically issues a publication called the KELLOGGRAM, which describes many of these services. If you are not already receiving it, we will be glad to add your name to the list if you will drop us a line at 225 Broadway, New York 7, N. Y.

M. W. KELLOGG
A SUBSIDIARY OF PULLMAN, INC.

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The Refiner's Notebook

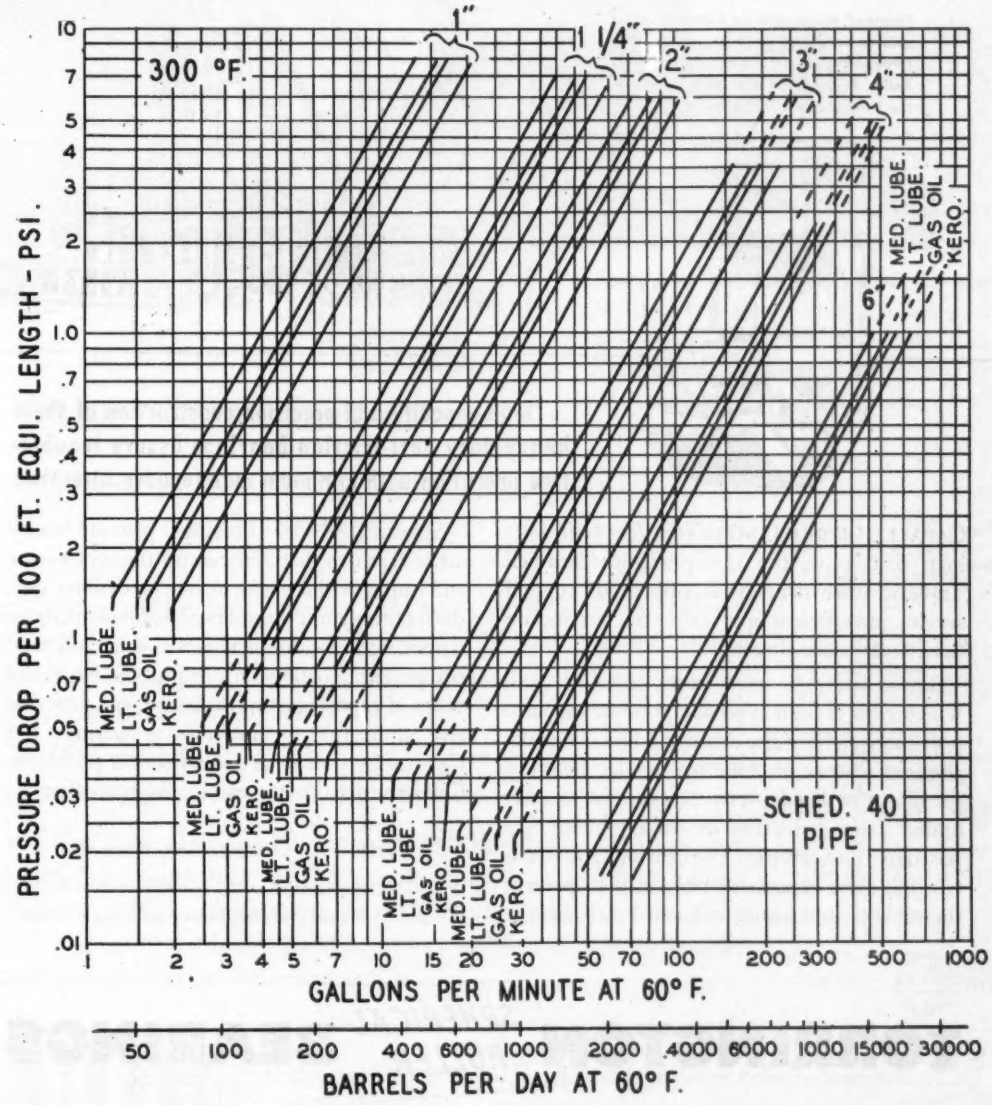
A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Pressure Drops—300° F.

Materials	A.P.I.	Viscosity at 100° F.
Gasoline	57	0.5 cp.
Kerosine	42	1.3 cp.
Gas oil	30	50 U.S.S.
Light lube	27	100 U.S.S.
Medium lube	24	500 U.S.S.

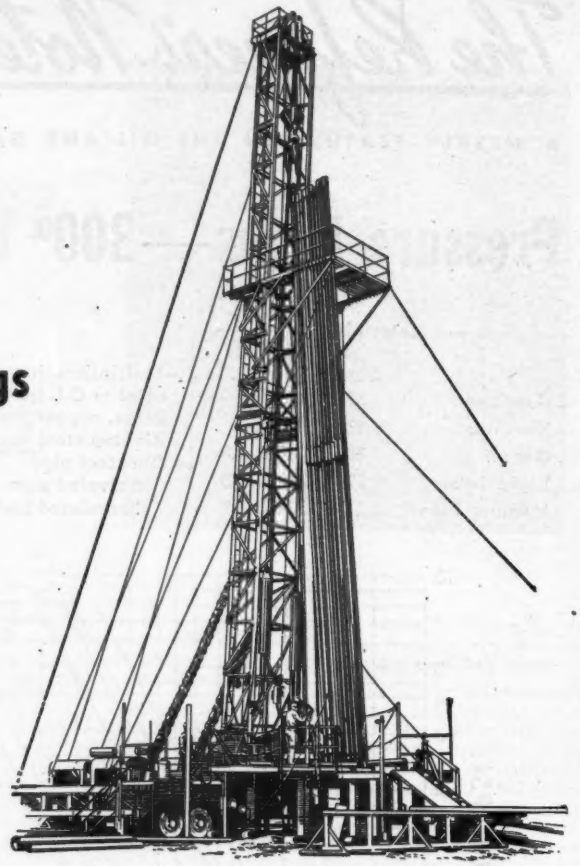
Multipliers for surface condition	
Steel or C.I. (new)	1.0
Brass, copper or lead	0.9
Riveted steel or old C.I.	1.4
Old steel pipe	1.6
Old riveted pipe	2.0
Tuberculated badly	2.5

Multipliers for pipe	Sched. 80	Sched. 160
1-in.	1.58	3.52
1½-in.	1.42	3.4
2-in.	1.38	2.74
3-in.	1.67	2.74
4-in.	1.30	2.23
6-in.	1.28	2.17

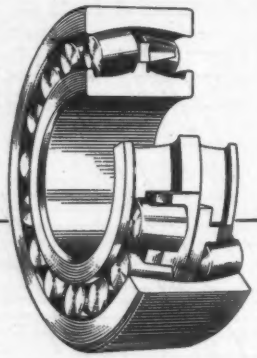


No. 209 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

Trailerig Built for Long Service Life with Torrington Spherical Roller Bearings



Cardwell Manufacturing Company, Inc. secures long, trouble-free service life through the use of Torrington Spherical Roller Bearings on the main drum of the transportable Trailerig.



... high capacity and precision construction of these heavy-duty anti-friction bearings assure trouble-free operation with minimum maintenance attention.

CAPABLE OF DRILLING to 5000 feet with 4½-inch drill pipe, the transportable Cardwell Trailerig main drum is equipped for rugged service and efficient operation with Torrington Spherical Roller Bearings.

These bearings must carry the line pull, which runs as high as 30,000 pounds, and support the weight of the drum and line. The self-aligning feature of Spherical Roller Bearings prevents the development of excessive stresses under shaft deflection or misalignment imposed by these stresses. The bearings also maintain the close clearances necessary to protect the oil seals and assure efficient lubrication.

Spherical Roller Bearings provide many other features that can extend the service life and improve the performance of drilling rigs, slush pumps, unit pumpers, transmissions, draw works, rotary table drives and other oil field equipment. Torrington's engineers have had years of experience in the design, construction and application of anti-friction bearings. Let them assist you with your friction problems. Call or write the nearest Torrington office.

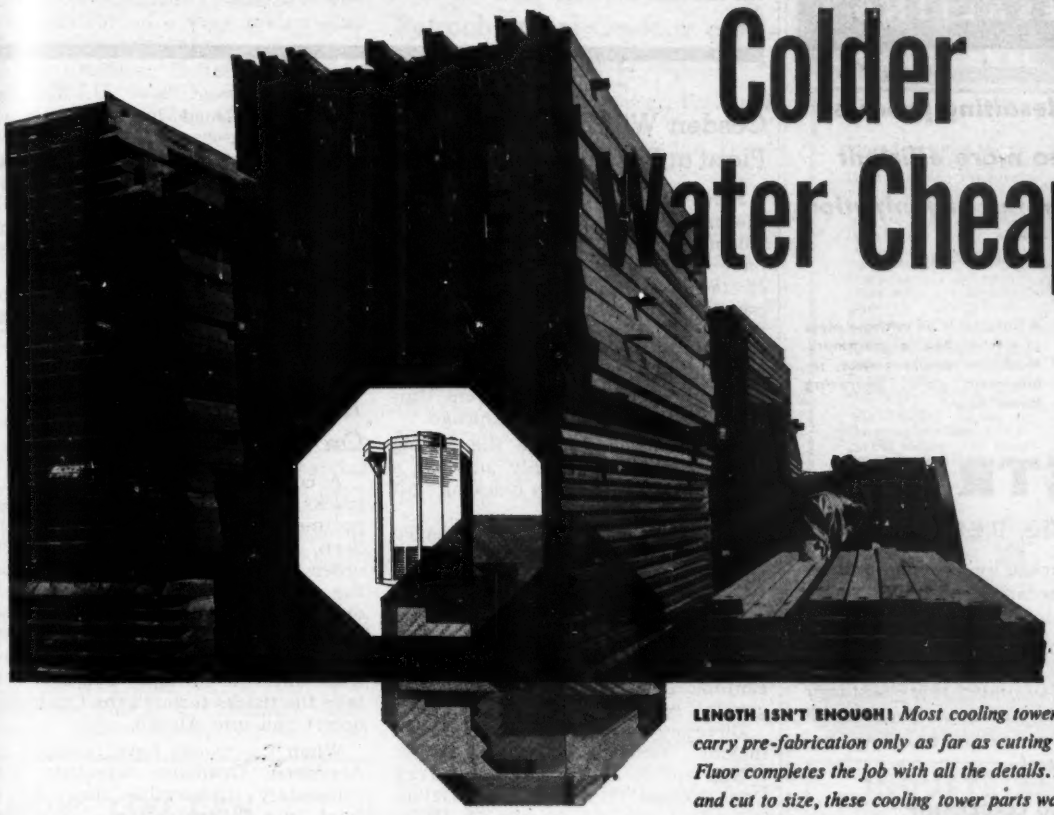
THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS

PREFABRICATION IN MASS PRODUCTION =

Colder Water Cheaper



LENGTH ISN'T ENOUGH! *Most cooling tower manufacturers carry pre-fabrication only as far as cutting parts to length. Fluor completes the job with all the details. Already shaped and cut to size, these cooling tower parts wait for shipment and erection. Biggest part of the job is done at the mill!*

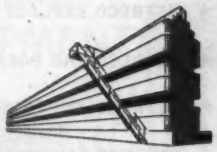
Cheaper? Yes, and here's why...

Only 258 parts for 66 models! Yes, 258 standard, interchangeable, factory-built parts will build any of the 66 Fluor *Counterflo* Models. Manufacture is simpler for us. Parts replacement is easier and cheaper for you.

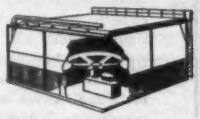
Quality up, Cost down! Factory precision puts holes in the right places, cuts slots and angles that don't vary. Factory speed cuts costs. Part of savings go into tower improvements, part to customers. Precision tooling and mass production team up to send quality up and prices down.

Delivery now! Not later. Standard assembly-line parts are stock-piled. No lost time in engineering. No special parts to slow production.

40% less erection time! That's what *complete* pre-fabrication means as compared to *partial* pre-fabrication. That's how much faster it is to erect a Fluor *Counterflo* Tower. And... equally important... there is no need to specially train a carpenter-crew for tower building. (Fluor either erects, or supervises erection, of towers... as the customer desires.)



Fluor Aerator atmospheric cooling towers are recommended where this type is the most practical.



The Fluor Fin-Fan cooling unit has a wide, economical range of utility throughout industry.

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SERVICES : *Designers and Constructors of Refinery, Chemical and Natural Gas Processing Units*

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A Desalter is an intricate piece of electro-chemical machinery. Machines require service, replacement parts, *operating know how.*

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★ PETRECO LAB FACILITIES
★ PETRECO EXPERIENCE
★ PETRECO KNOW HOW

The efficient removal of salts from crude oil is not a simple task—*except when handled by experts.* Petreco provides the *experts,* and the Petreco experts provide the *know how.* To simplify your salt removal problem, write or call the nearest Petreco headquarters — a Petreco engineer, with facts and figures on how Petreco can increase your profits, will call at your convenience.

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REFINING

Cosden Will Rebuild Plant at Big Spring

Plans for the reconstruction of the thermal cracking plant of Cosden Petroleum Corp. at Big Spring, Tex., have been approved by the newly elected board of directors at a recent meeting. The old plant, which was partially destroyed by fire in May 1947, will be changed from thermal to fluid catalytic cracking and will be operated under license from Universal Oil Products Co., Chicago.

Crude capacity of the Big Spring plant is 17,000 bbl. daily and has a charging capacity to its cracking unit of 12,000 bbl. daily.

Officers of the company elected for the coming year were: R. L. Tollett, president; Marvin M. Miller and Douglas L. Orme, vice presidents; A. V. Karcher, secretary and treasurer; V. A. Whittington, assistant secretary and assistant treasurer; Nelson Phillips, Jr., assistant secretary and general counsel.

Directors of the company reelected include: James L. Carey, Leo M. O'Neil and B. H. Roth of New York City; Nelson Phillips, Jr., of Dallas, Tex.; R. L. Tollett, Marvin M. Miller and A. V. Karcher of Big Spring, Tex.

Jersey Standard Regains Exclusive Patent Rights

Standard Oil Co. (N. J.) and its affiliates in a recent decree by a southern district federal court was given exclusive rights to oil refining processes covered by 544 patents purchased in 1929 from I. G. Farben Industries of Germany for $35,000,000.

The court ruling split the rights to 254 chemical patents, also bought by Jersey from Farben in 1929, between the alien property custodian and Jasco, Inc., in which Standard has a half interest. The custodian will receive royalties due Farben under the decision.

All of the patents were made royalty free to industry in 1942 for the duration of the war.

Texaco Laboratory Gets Railway Diesel Engine

The Beacon research laboratories of The Texas Co. recently installed a full size 600 hp. electromotive railway diesel engine for the purpose of studying railroad locomotive lubricants.

The laboratory will use the engine to study the effect of additives in railway lubricants on engine cleanliness and the performance of piston rings, bearings, wrist pins, and other parts.

The engine is a 6-cylinder V-type and is mounted on cast iron bed plate and anchored to bed rock.

Army to Test Greases On 20,000-Mile Route

A convoy of twelve 2½-ton Army trucks recently left the Ordnance Department's proving ground at Aberdeen, Md., on a 20,000-mile route in order to test in practical operation the new automotive greases developed by the industry and the Ordnance department. Six greases will be used on the trip, which will continue until the spring of 1949 and will take the trucks through the California desert and into Alaska.

When the trucks have returned to Aberdeen, Ordnance scientists will completely disassemble them for a final over-all evaluation of the performance of the greases.

The new greases are expected to eliminate the 30-hour delay which is now necessary to prepare a vehicle for cold-climate operation that had previously been lubricated with warm weather greases.

Pan American Plans New Buildings at Texas City

HOUSTON. — Four new buildings will be constructed by Pan American Refining Corp. at its 104,000-bbl. daily refinery in Texas City.

The work includes a two-story brick and tile office building, a pilot plant and laboratory additions to an existing building, and a chemical laboratory building.

O.W.I.U., Two Companies Reach Wage Agreement

HOUSTON.—The Oil Workers International Union has reached an agreement with Republic Oil Refining Co. providing a new 2-year contract for about 300 union members at the company's Texas City refinery.

Union officials said the new contract included a 9-cent hourly general

wage increase for each classification and several classification adjustments, increased sick benefits, funeral pay allowance, severance pay allowance, and elimination of the cost-of-living bonus for additions to the base pay. The privilege of a wage review after 1 year also is provided.

Pan American Refining Corp. and an O.W.I.U. local have reached an agreement providing for a wage increase of 9 to 13½ cents an hour for workers at the Texas City refinery of Pan American.

Contract terms also include liberalized vacation and holiday provisions, according to union officers.

Safety Award to General

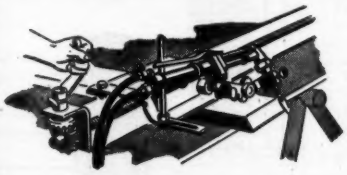
General Petroleum Corp.'s Torrance, Calif., refinery was awarded recently an American Petroleum Institute "1,000,000-hour certificate" for its safety record of 1,180,000 man hours of work without a disabling injury, covering a period of 211 days. A new safety program plan was initiated by General's manufacturing department in February 1947.

S. C. M. A. To Meet August 19

At the invitation of the Union Oil Co. of California refinery in Wilmington, Calif., the Southern California Meter Association will hold its meeting August 19 at Union's plant where the group will be conducted through the refinery shops and trainee classrooms.

NOW YOU CAN MACHINE-FEED YOUR WELDING TORCH

C&H STRAIGHT LINE CUTTER



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Petrochemical Outlook on Gulf Coast Called Bright

HOUSTON.—Another prediction of a bright future for the burgeoning petrochemical industry on the Texas Gulf Coast was made recently by D. M. Dinkins, New York, president of Jefferson Chemical Co.

In a talk at Port Arthur, Dinkins said the area has the raw materials, particularly petroleum hydrocarbons, needed for continued expansion as a chemical center. "There is no question that it is destined for a great growth," he declared.

Jefferson Chemical, jointly owned by The Texas Co. and American Cyanamid Co., this spring opened an ethylene oxide and ethylene glycol plant at Port Neches. The plant operates on gases from Texaco's Port Arthur refinery. Emphasizing the interdependence of Gulf Coast chemical plants, Dinkins pointed out the Jefferson plant buys lime from the U. S. Gypsum Co.'s plant at New Braunfels, water from the Lower Neches Valley Authority, and chlorine from Southern Alkali Corp.'s plant at Lake Charles, La.

The Jefferson Chemical president indicated expansion is planned at the Port Neches plant. "We are not ready to say anything about our future plans, but we have 1,100 acres of land around our Port Neches plant, only 100 acres of which is now in use," he said.

Wisconsin Gulf Company Issued Court Injunction

A permanent injunction was issued recently against Gulf Oil Co., a Wisconsin corporation, from further use of that name in a decision by the United States District Court for the eastern district of Wisconsin. The decision was the result of the case brought by Gulf Oil Corp., a Pennsylvania corporation.

The decree also forbids the Wisconsin firm from using the word "Gulf" and any like or similar name in their corporate name or business, or as a brand, trademark, or trade name for petroleum products.

Sun to Build Oil Depot

PORT STANLEY, Ont.—Sun Oil Co. has started work on a new marine and distribution depot. The plant will include two storage tanks with capacity in excess of 1,000,000 gal. each, a warehouse and track and railway facilities. The plant will be supplied by a pipe line from the harbor.

PENBERTHY

"REFLEX"

DROP FORGED STEEL LIQUID LEVEL GAGES

Liquid always shows black—empty space shows white. Preferred where the liquid level must be easily and positively visible, and when liquids are under high pressure or at high temperature. Made of alloy temperature resisting steel and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Reflex" is one of the complete line of Penberthy Gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

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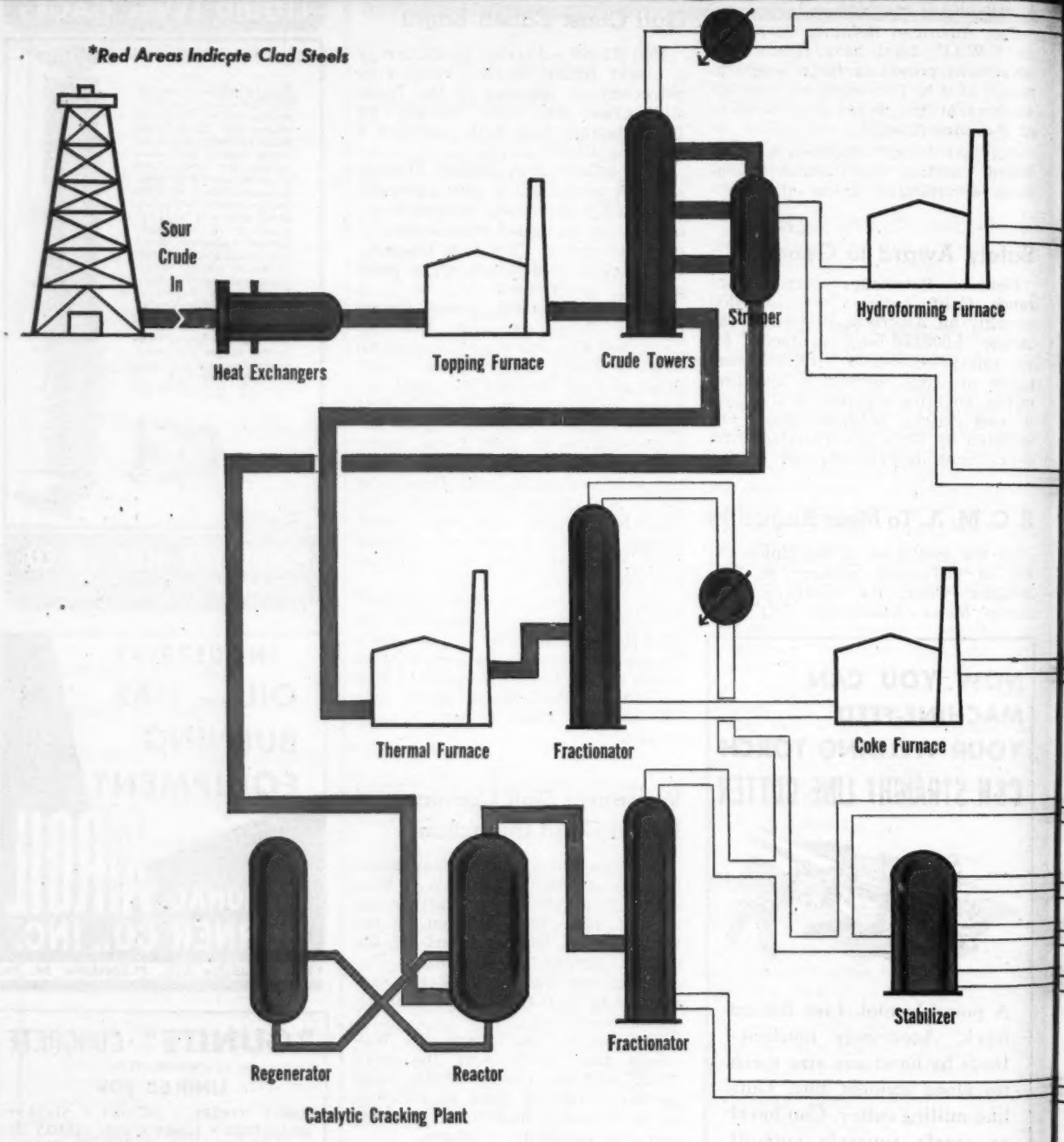

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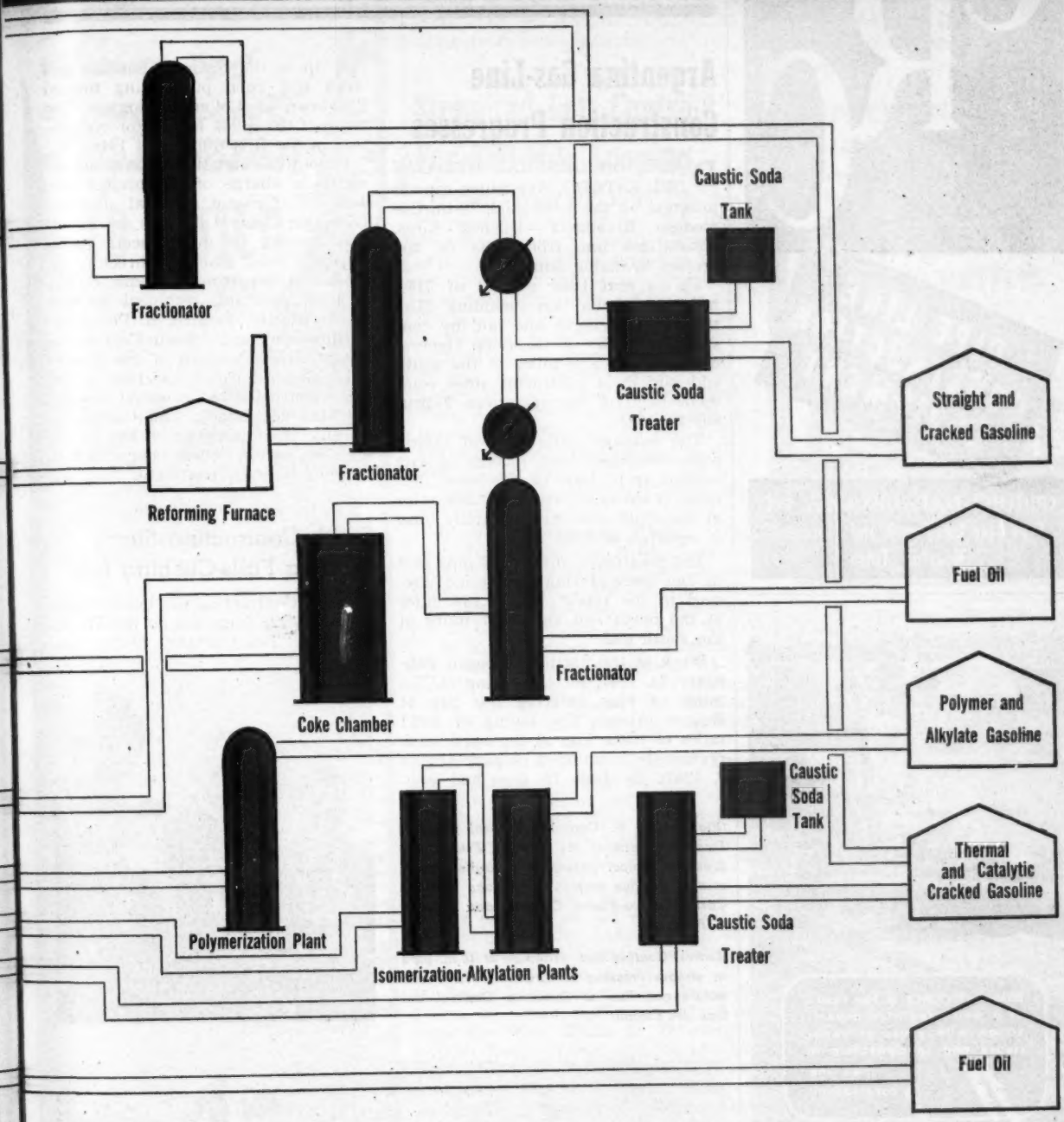

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The new publications, No. 461 "Economical Corrosion Protection for the Petroleum Industry" and No. 399 "Fabrication of Lukens Clad Steels" will be sent on request to Lukens Steel Company, 455 Lukens Bldg., Coatesville, Pa.

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PIPE LINES

Argentina Gas-Line Construction Progresses

DIRECCION GENERAL DEL GAS DEL ESTADO, Argentina, reports progress on the 1,100-mile, 10-in. Comodoro Rivadavia — Buenos Aires, natural-gas line from data on the project available June 15.

Up to that time a total of 316.6 miles had been laid including 248.7 miles on the north end laid by construction crews of Direccion General del Gas and 67.9 miles at the south end laid by a contractor since commencement of his operations February 26, 1948.

The average daily rate of laying pipe, computed from records of line welded up to June 15, has been 1.553 miles at the north end and 1.242 miles at the south end. Average daily total is reported at 2.795 miles.

The maximum amount of pipe laid in one week during the period covered in the report was 11.184 miles at the north end and 7.767 miles at the south end.

Work at the north end began February 24, 1947, for the laying of 27.8 miles of pipe entering the city of Buenos Aires. The laying of 248.7 miles of main line at the north end, previously mentioned, began August 6, 1947. By June 15, pipe had been laid up to the town of Laprida and work had been progressing toward the town of Colonel Pringles. The entire 1,100 miles is due for completion in the first quarter of 1949.

Executives and superintendents directly in charge of the project are: Julio V. Canessa, general director, Direccion General del Gas del Estado and director of the project; Carlos Lucero Flores, assistant director, exploitation department; Pedro F. Rodriguez, assistant, technical director of the project; Estaban R. Perez, superintendent, and Alberto Carrizo, assistant superintendent of the Buenos Aires-General Conesa section of the line constructed by Direccion General del Gas del Estado; and Casildo L. Pacella, chief inspector of the Comodoro Rivadavia-Conesa section which is being built by contractor.

Smith Contracting Starts Wichita Falls-Cushing Job

Smith Contracting Co. began right-of-way work August 1 on the Wichita Falls, Tex.-Cushing, Okla., 170-

(Right) Julio V. Canessa, general director, Direccion General del Gas del Estado, addressing project personnel regarding progress of gas-line project. The group includes Carlos Lucero Flores, Canessa and Estaban E. Perez

(Lower) Coating and wrapping of 10-in. pipe at stream crossing of Argentine 1,100-mile natural-gas line of Direccion General del Gas del Estado

PIPELINES

•Finances
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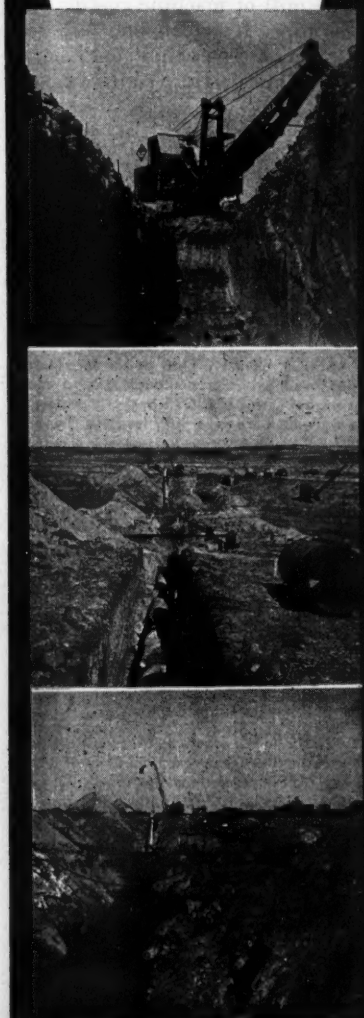

OIL PIPELINES GAS PIPELINES GASOLINE PIPELINES WATER PIPELINES

R. H. Fulton & COMPANY
CONTRACTORS
R. H. FULTON, OWNER

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LUBBOCK, TEXAS

mile, 24-in. section of the Jal-Cushing project undertaken by Texas Pipe Line Co., Shell Pipe Line Corp., Empire Pipeline Co. and Sinclair Refining Co.

Pipe is due to arrive August 20; pipe laying is expected to commence August 25. The initial field office is established in Wichita Falls. C. C. Craig is spread superintendent.

Stanolind Lets Contract For 580-Mile Looping

STANOLIND PIPE LINE CO. has awarded contracts for the construction of approximately 580 miles of 8, 10, 12 and 16-in. pipe-line loops on its main trunk-line system in Wyoming, Nebraska, Kansas and Texas, according to a recent announcement by J. L. Burke, president.

Construction is to start immediately and is scheduled for completion before the end of the year. When these new pipe-line loops are put in service, Stanolind will be able to increase deliveries to refineries by 46,000 bbl. per day.

The contracts were awarded as follows:

C. S. Foreman Co., Kansas City, Mo., to construct 53 miles of 16-in. and 32 miles of 10-in. on the Casper, Wyo., to Freeman, Mo., line in Kansas, and the hauling and stringing to J. L. Cox & Son, Raytown, Mo.

R. B. Potashnick, Cape Girardeau, Mo., to construct 64 miles of 16-in. on the Casper, Wyo., to Freeman, Mo., line in Nebraska and Kansas, and hauling and stringing awarded to J. L. Cox & Son.

R. H. Fulton & Co., Lubbock, Tex., to construct 33 miles of 16-in. and 24 miles of 12-in. on the Casper, Wyo., to Freeman, Mo., line in Wyoming, and stringing and hauling awarded to the John Bunning Transfer Co. of Rock Springs, Wyo.

R. H. Fulton & Co. to construct 31 miles of 16-in. on the West Texas to Drumright, Okla., line in Texas, and the hauling and stringing awarded to Parkhill Truck Co., Tulsa.

Latex Construction Co., Houston, Tex., to construct 55 miles of 16-in. on the West Texas to Drumright, Okla., line in Texas, and the hauling and stringing awarded to J. R. Vandaveer & Son of Neodesha, Kans.

Smith Contracting Corp., Fort Worth, Tex., to construct 51 miles of 16-in. on the West Texas to Drumright, Okla., line in Oklahoma, and the hauling and stringing awarded to J. R. Vandaveer & Son; and 34 miles of 10-in. and 46 miles of 12-in. extending the West Texas-Drumright line into Ector County, Texas, and the hauling and stringing awarded to Parkhill Truck Co.

O. C. Whitaker Construction Co., Fort Worth, Tex., to construct 50 miles of 16-in. on the West Texas-

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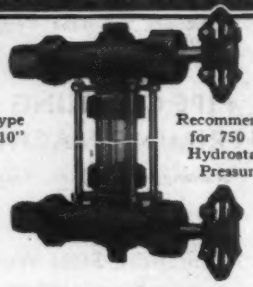

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Recommended for 750 lb. Hydrostatic Pressure

Steel construction throughout with stainless steel interior trim. Automatic shut-off is positive and instantaneous; stainless steel balls shut off the flow of liquid when glass breaks. Heavy duty stuffing boxes, union connections, offset construction facilitate cleaning and simplify glass replacement. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

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Drumright line in Oklahoma, and the hauling and stringing awarded to Parkhill Truck Co.; and 35 miles of 12-in. and 70 miles of 8-in. on the Casper, Wyo., to Freeman, Mo., line in Wyoming, and the hauling and stringing awarded to Tom Weadick, Casper, Wyo.

Projects for which these contracts have been let are part of the Stanolind Pipe Line Co. program shown in "Table of Domestic Crude Oil Projects," page 191, July 29, 1948 issue of The Oil and Gas Journal.

Pacific Gas Plans 510-Mile Line

Pacific Gas & Electric Co., San Francisco, has requested Federal Power Commission authority to build a 510-mile pipe line from Milpitas, Santa Clara County, California, to the California-Arizona boundary near Topock, Mohave County, Arizona.

The proposed line would connect with the proposed system of El Paso Natural Gas Co. in Arizona to move natural gas into California from the fields in the San Juan basin in New Mexico, Colorado and Utah and from the Permian Basin in New Mexico and Texas.

At a terminal near Milpitas, the pipe line would connect with lines serving San Francisco, Oakland, Berkeley and other cities in the East bay area.

Construction of the Milpitas-Topock line is planned to begin in 1949 and the initial capacity would be 150,000,000 cu. ft. of gas daily during the first year following completion. With the addition of compressor capacity, the line would have an ultimate delivery capacity of at least 400,000,000 cu. ft. daily. Completion of all proposed facilities is planned by July 1954.

Trunkline Gas Amends Texas-Iowa Line Plans

WASHINGTON. — Trunkline Gas Supply Co., headed by Ralph K. Davies, has filed an amended application with the Federal Power Commission making changes in its plans for an 855-mile pipe line from Texas to Iowa.

The original application, filed March 20, 1947, provided for a 30-in. line with a designed daily delivery capacity of approximately 425,000,000 cu. ft., with 12 compressor stations, the over-all cost of which was estimated at $74,266,507.

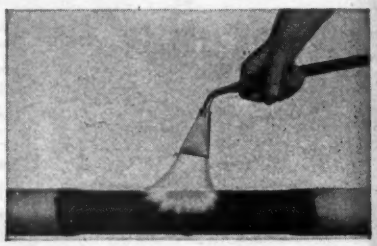
Under the amended application, the line would be reduced to 26 in. and shortened to 768 miles.

The FPC hearing on the company's proposed transmission system, previously set to open November 8, has been advanced to September 8 by the FPC.

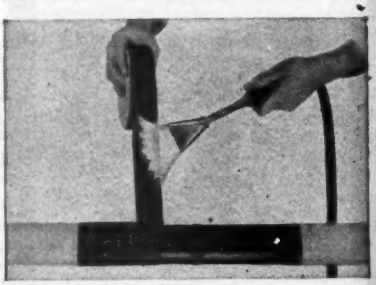
It's EASY to Protect PIPE JOINTS with TAPECOAT

Just follow three simple steps

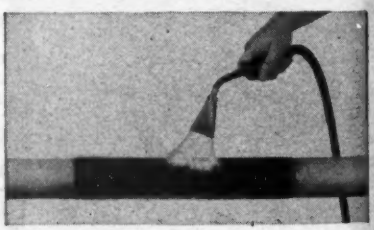
A practical, protective coating in handy tape form, TAPECOAT is easy to apply on pipe joints to give protection equivalent to the mill or machine coating on the pipe. It's clean—no dirt, no mess. Saves time and labor. Economical. Here's all you do:



STEP 1—Remove kraft paper on mill or machine coating back far enough to start one spiral wrapping of TAPECOAT over mill coating. Clean and dry bare pipe with torch as shown.



STEP 2—Start wrapping TAPECOAT where kraft paper has been removed. Flash flame of torch *lightly* on TAPECOAT to bleed its coating. Secure double thickness of TAPECOAT by overlapping slightly more than half the width of the tape.



STEP 3—Finish wrapping TAPECOAT. When wrapping is completed, flash the torch flame over entire TAPECOATED section to bleed coating to a shiny surface.

Write for complete details

The TAPECOAT Company
1523 Lyons St., Evanston, Illinois

NATURAL GAS

United Gas' Project in East Texas Progressing

HOUSTON.—United Gas Pipe Line Co. is making rapid progress on a $2,500,000 construction project which is expected to provide more natural-gas fuel to industries in the Dallas-Fort Worth area by early fall.

The project involves both pipe-line and compressor-station work and is mostly in East Texas, according to M. A. Abernathy, vice president of United Gas Pipe Line. Abernathy's headquarters are at the company's main offices in Shreveport. He was here on visit recently.

Three phases of the expansion already completed are: a 13.2-mile, 18-in. pipe line paralleling United's main line west of Mineola, Tex., increasing capacity out of the Mineola compressor station by several million cubic feet daily; more than 7,000 ft. of 12-in. line laid to Dallas Power & Light Co. from United's line serving industrial customers south and west of Dallas; and a 12-in. loop 4½ miles long, built to the Texas Electric Service Co. plant at Handley, from United's main line east of Fort Worth.

A. G. A. Research Program Receives Recognition

In a recent study by the United States Department of Commerce, trade association division, the research program of the American Gas Association was cited as a guide for other industries contemplating research projects. The gas industry's expenditure of $600,000 per year in gas production research, domestic gas research, industrial gas research, and general technical research was listed as one of the most ambitious in its field.

Approximately 50 organizations, now active in scientific and technical research, testing and development, were surveyed by the government bureau. The purpose of the study is to aid executives in guiding early organization for research, as well as improving present management practices.

Natural-Gas Sales for June Up 8.7 Per Cent

Natural-gas sales by the gas-utility industry for June totaled 2,007,558,000 therms (about 21,132,200 cu. ft.), an increase of 8.7 per cent over the 1,847,537,000 therms (about 20,500,390 cu. ft.) sold in June 1947. For the 12-month period ending June 30, 1948, natural-gas sales increased 10.4 per cent over the previous year, according to a report by the American Gas Association.

Sales of mixed gas for June showed a decrease of 28.4 per cent as compared to June 1947, while manufactured gas sales in the comparable periods showed a gain of 1.3 per cent.

Total sales of gas by the gas-utility industry showed a total of 2,245,092,000 therms for the month, a gain of 6.4 per cent as compared to the same month a year ago. For the 12-month period ending June 30, 1948, total sales of gas amounted to 30,551,223,000 therms, an increase of 8.5 per cent over the 28,169,075,000 therms sold in the previous year.

Panhandle's Rates to Ohio Fuel Are Authorized

The Federal Power Commission has authorized a supplement to the existing rate schedule of Panhandle Eastern Pipe Line Co. for sales of natural gas to Ohio Fuel Gas Co. to take effect as of July 23.

The supplement obligates Panhandle to make available to Ohio Fuel until April 30, 1949, at the Maumee, Ohio, delivery point of Panhandle's system a volume of not less than 15,000,000 cu. ft. of the 25,000,000 cu. ft. of gas daily which Panhandle is now obligated to deliver to Ohio Fuel under the present rate schedule.

Rate Schedule Withdrawn

Penn-York Natural Gas Corp. has withdrawn its application for a rate schedule supplement providing for an increased rate for temporary additional deliveries of natural gas to its affiliate, Republic Light, Heat & Power Co. The rate schedule was suspended by the Federal Power Commission in an order of June 4.

FPC Denies Application

The Federal Power Commission has denied an application by several companies requesting that the Commission reconsider and revoke its order of May 29, authorizing Trans-Continental Gas Pipe Line Co., Inc., to construct and operate a natural-gas pipe line extending from the Gulf Coast area of Texas and Louisiana to New York City. (For details of the proposed project see The Oil and Gas Journal, June 24, page 330).

Natural Gasoline

Warren Expansion of Storage Capacity Begun

CONSTRUCTION of four large liquified petroleum gas storage terminals of Warren Petroleum Corp. to be located at strategic points throughout that company's marketing territory is now under way.

The location and capacity of each terminal follow: Mobile, Ala., 1,800,000 gal.; Little Rock, Ark., 1,440,000 gal.; Des Moines, Iowa, 960,000 gal.; and Cedar Rapids, Iowa, 600,000 gal. The four terminals will have a total of 160 high-pressure tanks of 30,000-gal. capacity each with a combined capacity totaling 4,800,000 gal. of propane or other liquefied petroleum gases.

All of the terminals are expected to be ready for service by this winter, making a total storage capacity for Warren of 12,500,000 gal. of L.P.G., in addition to several million gallons of storage at various manufacturing plants of the company. One or two additional sites are reported under consideration for installation of terminals later this year.

The new terminals are a part of the company's program to conserve seasonal excess production for ready distribution in periods when current output is inadequate to meet peak demand.

La Gloria Corp. Plans Compressor Plant

CORPUS CHRISTI.—A 4,800-hp. compressor plant to handle about 16,000,000 cu. ft. daily of casing-head gas now being flared in La Gloria field in Southwest Texas, is planned for construction by La Gloria Corp.

The compressor plant will be built at the company's present cycling plant at Falfurrias, and a part of the facilities are expected to be ready for operation next spring. About 15 miles of gathering line will be laid, and the new plant will draw casing-head gas from 137 wells in La Gloria. Gas also will be processed from von Blucher field, which is owned by La Gloria. Total capacity of the compressor installation will be about 20,000,000 cu. ft. daily which is expected to be sufficient for all requirements when development of La Gloria field is completed.

Are your slush pumps "EATING UP" your profits?

Do jammed valves, leaky pistons, and scored piston rods "eat up" your profits by reducing slush pump efficiency and increasing shut-down time?

If they do, here's a suggestion: Install Mission Valves, Pistons, Rods, and Gland Packings in ***all*** your pumps.

Then follow the suggestions of your Mission Field Service Man as to replacement practices and schedule. Here's what you'll find:

FIRST, your pumps stay on the job better! Shut-down time will be reduced and you will be able to depend on your pumps when the going is tough.

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SLUSH PUMP VALVE
Champion for *extremely* severe service. Proved sturdier and longer-lived through four years of field testing.

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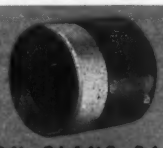
The most economical valve for general service. Replaceable wear taking bushing means longer valve seat life.



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Pressure seal regulates packing tightness for longer packing and rod life.

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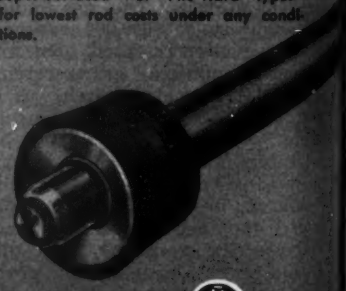
Easily replaceable rubbers permit saving the piston body and the extra long rubber life reduces replacement costs.

MISSION PISTON ROD
"Super-Surfaced"* or "File Hard" types for lowest rod costs under any conditions.



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Mission
slush pump parts

Among the

Drilling Contractors

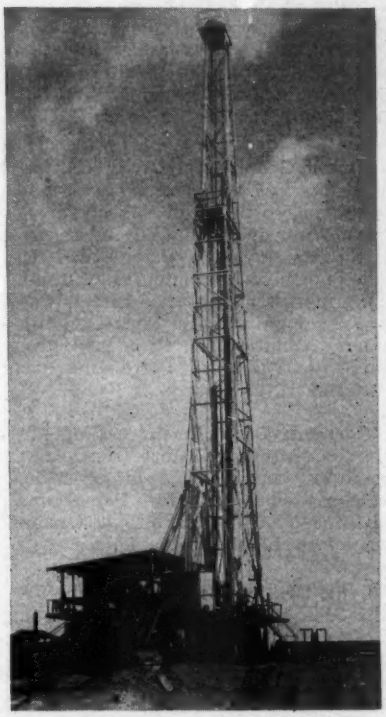
Barlow Brothers of Lloydminster have contract for a well to be drilled for Edgerton Oils on the Oscar Norland farm, in the Edgerton area, eastern Alberta.

Rowan Drilling Co. has been awarded contract by Tide Water Associated Oil Co. to drill its 1 Lafourche Realty, 12-20s-22e, Lafourche Parish, Louisiana, 3 miles west of the Grandison Prospect. Contract depth is 12,000 ft.

Loffland Brothers have been awarded contract to drill California Co. 1 Burkenroad Investment & Realty Co. 2. located 3½ miles east of Valentine field in Lafourche Parish, Louisiana, Section 100-17s-20e. Projected depth is 10,500 ft.

Crow Drilling Co. of Shreveport, La., has been awarded contract to drill two Mississippi wildcats by Carter Oil Co. In Sharkey County, location has been staked for 1 Houston Estate, in NE NE 1-10n-7w; and in Yazoo County, Medie Morgan will be drilled in S/2 NW NE, 10-12n-3w.

Brunson Drilling Co. has the contract for the National Cooperative Refinery Association and S. B. Smith 1 Smith, SE SE SW 8-9-18, 1¼ miles east of Southeast Barry pool and 2



Shown at right is Duncan Drilling Co.'s No. 2 rig, drilling for Skelly Oil Co. at its 1 Fugate, wildcat deep test, in NE NE NW 35-6n-9w, Caddo County, Oklahoma. In the drilling crew, shown below, are: Lee Wasson, driller; Al Keim, backup man; Jack Rogers, motor man; Willard Scarbarough, derrick man, and B. G. Smart, lead tong man

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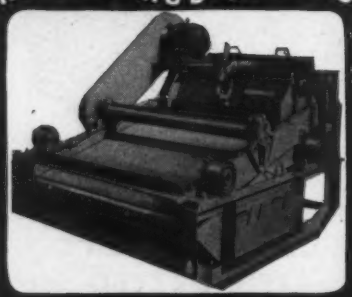

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miles northwest of Paradise Creek pool, Rooks County, Kansas.

Dunlap & Graham Drilling Co. has completed a new discovery in the El Segundo area of Los Angeles County, California. Known as the 5 Six Companies, 2-3s-15w, the well was good for 86 bbl. daily on pump. It was drilled on contract for Standard Oil Co. of California.

Southern Six Drilling Co. will drill Sparta Oil Co. 1 W. Prescott Foster Estate, 13-15s-10e, 2 miles south of Franklin townsite, St. Mary Parish, Louisiana. Contract depth is 10,500 ft.

Drilling contractors currently drilling wells for Richfield in the new Cuyama Valley field of San Luis Obispo and Santa Barbara counties include **Tracy Harkness Drilling Co., Hoover Drilling Co., Walter Buaas Drilling Co., Santa Maria Drilling Co., Bell & Burden,** and **Stansbury, Inc.**

United Geophysical Co. of California is starting a survey of more than 600,000 acres in seven Alberta areas from Wintering Hills, 60 miles east of Calgary, to Lesser Slave Lake, 100 miles north of Edmonton. Sponsoring the gravimeter survey, to be followed by seismograph, are Pacific Petroleums, Atlantic Oils, Princess Petroleums, and Empire Petroleums, all of Calgary.

Northern Development Co. of Edmonton, Alta., will start work early in August on the first of six wells to be drilled for Allenbee Petroleums of Vancouver, in the Saskatchewan section of Lloydminster field.

Lynn Drilling Co. has contract for Aberdeen Petroleum Corp. 1 Ada Burk, 4,500-ft. Arbuckle wildcat in C SE NE of 27-26n-2w, 3 miles southwest of the old Hubbard field in Kay County, Oklahoma. Operations are to begin soon.

Rine Drilling Co. tools are making hole on Lion Oil Co. 1 Schrepel, NW NW SE 19-29-14, 3½ miles northwest of the Shriver pool, Pratt County, Kansas, on a farmout from Stanolind Oil & Gas Co.

Gabbert & Lindas are below 2,000 ft. on the Bay Petroleum Corp. 1 McConnell, SW SW SE 25-6-18, in the northern section of Rooks County, Kansas, 4 miles south of Faubion pool and 3 miles north of Stockton, Kans.

Whitman Drilling Co. has been awarded contract to drill Magnolia Petroleum Co. 2 Abel West Heirs, located in Section 27-14s-10w, 3½ miles northeast of the 1 Abel West Heirs "Holly Beech" discovery in Cameron Parish, Louisiana. Contract depth is 13,000 ft.

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TONG DIES

Web Wilson "TIGER TOOTH" Tong Dies have a pyramidal, pointed tooth pattern that assures a positive, "biting" grip on the hardest tool-joints under the strongest pulls. Especially recommended for flame-hardened and hard metal surfaced tool joints or wear subs. The sloping sides and heavy base of the pyramidal shaped teeth gives extra strength and backing to each tooth. Tiger Tooth Tong Dies will not easily break down even in severe service. They are of the "full-length" design that completely fills die slot in the tong and are reversible to provide extra service life..."TIGER TOOTH" Tong Dies will fit all tongs used in the oil fields today—for dependable, economical service, specify WEB WILSON "TIGER TOOTH" TONG DIES.

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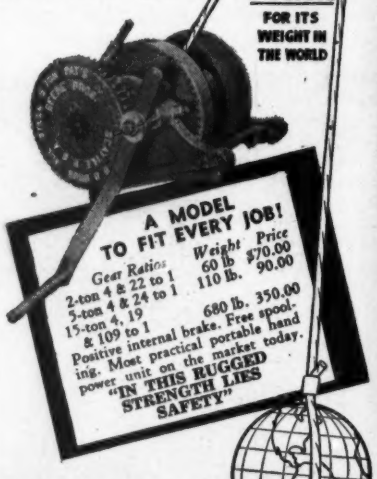

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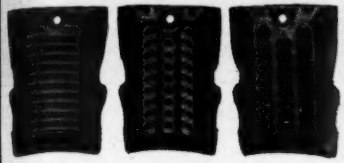

"Varco" buttons, popular for years in rotary drill pipe slips, proved satisfactory and have been adopted and are installed in segments of automatic casing spiders and elevators of various makes. Wickers are removed and holes bored for a maximum number of VARCO casing buttons, to assure uniform and maximum gripping area. Converting buttons for the next smaller casing are available. Write for complete descriptive data.

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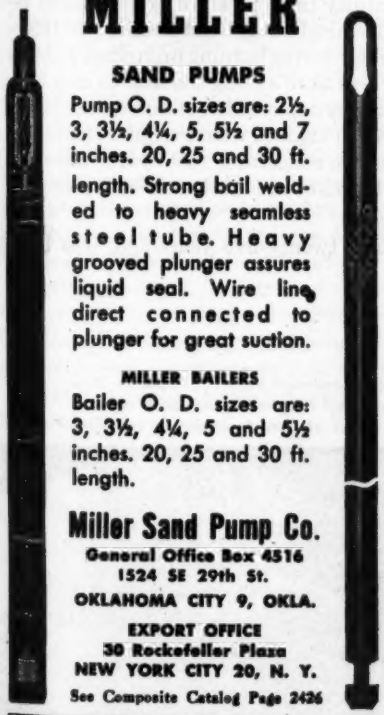

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Pump O. D. sizes are: 2½, 3, 3½, 4¼, 5, 5½ and 7 inches. 20, 25 and 30 ft. length. Strong bail welded to heavy seamless steel tube. Heavy grooved plunger assures liquid seal. Wire line direct connected to plunger for great suction.

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See Composite Catalog Page 2426

Santa Fe Drilling Co. Santa Fe Springs, Calif.

J. D. ROBINSON

Growth.—Santa Fe Drilling Co. was incorporated December 19, 1946, following the purchase of all drilling equipment owned by Union Oil Co. of California. This equipment consisted of nine drilling strings and three repair strings. The company started its business on February 1, 1947, when it spudded in its first well. Offices are maintained at Santa Fe Springs.

Personnel.—J. D. Robinson, president, and R. A. Powell, secretary-treasurer. In addition to the two officers, directors include H. P. Wickersham, mechanical engineer; Frank Gess, general drilling superintendent; Howard Robinson, superintendent of the southern division; Leo Goss, superintendent of the San Joaquin Valley division; and G. A. Henry, foreman of the San Joaquin Valley division.

Rigs.—Santa Fe currently is operating 17 drilling rigs and 1 repair string which it owns and 1 other rig which has been leased. These rigs consist of all types, ranging from blitz rigs to heavy-duty steam outfits and capable of drilling either shallow or extremely deep holes.

Sidelights.—Santa Fe Drilling Co. now has 420 employes, over 200 of whom formerly were employed in the drilling department of Union Oil Co. Robinson formerly was general superintendent of drilling for Union and Powell was division accountant for the same company. Total stockholders in the company number 62, and all of these, which include more than 40 drillers, are active employes of the company.

Santa Fe does not specialize in any particular type of drilling and, according to Robinson, "will tackle anything whether it be a straight hole, slant hole, shallow, or extremely deep well."

C. E. Blount Drilling Co. has completed its fourth well on the Scarborough lease in North Scarborough field which it opened in Winkler County, West Texas.

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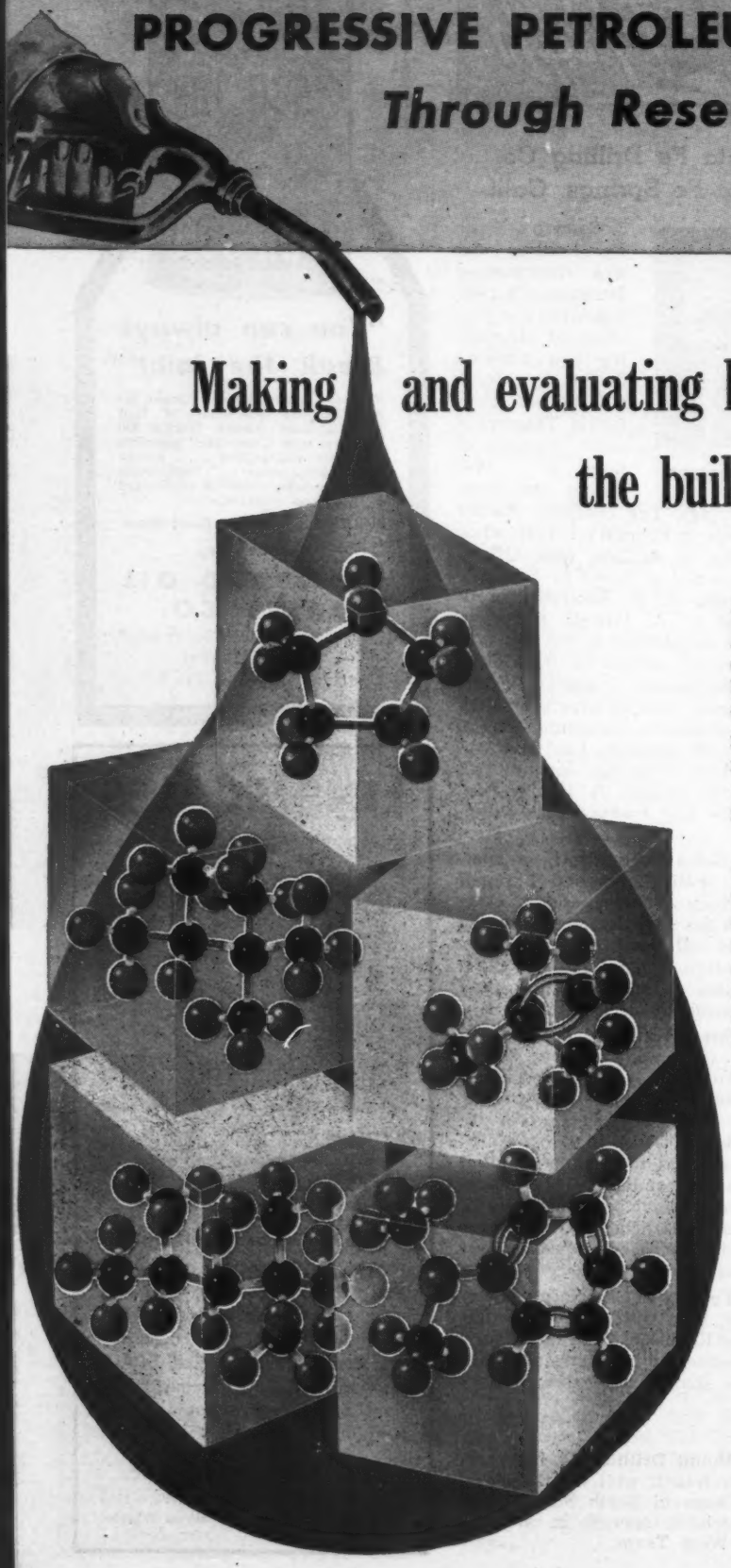


Making and evaluating hydrocarbons— the building blocks of gasoline

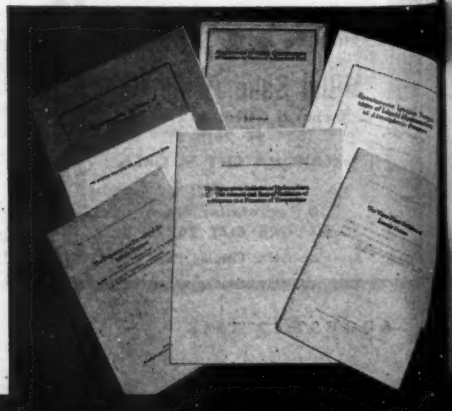
IN THE EARLY DAYS of the automobile, gasoline quality was considered to be principally a matter of volatility, which in turn was roughly indicated by "gravity." As new refining processes were introduced, however, and automotive engines were improved, it was found that fuels of equal gravity might not have the same volatility characteristics —and that neither indicated the performance of fuels in respect to "spark knock."

As a consequence, it was reasoned that fractions of given volatility from different crudes might be different in chemical nature and thus cause differences in behavior during burning in engines. Ethyl's research workers were among the first to conclude that a satisfactory explanation of differences in behavior of fuels in engines would require the maximum information concerning fuel hydrocarbons—the building blocks of which all petroleum products are composed.

Thus, nearly twenty-five years ago, was born

•

Numerous technical papers have been written by the Ethyl Research Laboratories staff on the subject of pure hydrocarbon research.



Ethyl Corporation's Detroit Laboratories are designed for research on problems of fuel-engine-lubricant interrelationships.

the idea behind one of Ethyl's fundamental research programs, which has been carried on continuously ever since for creation of a background of knowledge about hydrocarbons, and particularly about the combustion of hydrocarbons.

In 1926 the Ethyl Laboratories prepared all of the heptanes and a number of octanes. Among these early chemical curiosities was triptane, which is among the best of antiknock fuels known today. Normal heptane and iso-octane were first proposed by Ethyl as antiknock reference fuels, and have since proved of inestimable value for this purpose.

During the intervening years many more pure hydrocarbons have been isolated and studied. The Ethyl Laboratories have, in addition to work done independently, cooperated extensively with other laboratories of the oil and automotive industries in a program for the preparation and testing of as many as possible of the hydrocarbons likely to be present in gasoline. Research conducted or financed by Ethyl has included studies of hydrocarbons in specially designed engines, in laboratory combustion apparatus, and in spectroscopic equipment.

Background information on hydrocarbons is used by Ethyl, in cooperation with oil companies, for studies of experimental and commercial fuels. The aim of these studies is to find the combinations into which such fuels may be blended along with tetraethyllead to form the best and most economical gasoline for present and future engines. As new refining processes are developed, they complicate the technology and economics of gasoline production. Thus these studies become increasingly important both to refiners and to engine manufacturers.

Research on pure hydrocarbons is only one of the services performed by the Ethyl Research Laboratories for the benefit of refiners. Future messages in this series, of which this is the fifth, will discuss other phases of the complex problem faced by refiners in providing gasoline for today's and tomorrow's engines, and the contributions of the Ethyl Corporation to their solution.

★ ★ ★

This 16-ft. distillation column is used for the preparation of pure hydrocarbons.

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This supercharged "17.6" engine is used in research on pure hydrocarbons. The engine was designed and developed in the Ethyl Laboratories especially for research on fuel-engine relationships under conditions of high power development.

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Exploration and Drilling

Benedum Prospects in West Texas Not Too Promising

A REEXAMINATION of the geological interpretations and the prospects of Benedum field in West Texas is obviously in order, as the results of the wells reaching pay depth look discouraging to say the least.

One dry hole, 3 miles west and a little north of the discovery, has been ordered plugged, after finding nothing anywhere from the Clear Fork pay of the Permian down through the Ellenburger. This well ran 480 ft. low on the top of the Ellenburger, compared to the discovery.

A well about 3 miles north and a little west of the discovery is probably dry, although the upper pays have not yet been completely tested. It ran about 600 ft. low on the Ellenburger compared to the discovery.

A well a bit east of the second one, and about 2¾ miles north and a little west of the discovery, has not reached the Ellenburger, but is running around 500 ft. low on the top of the Silurian. It will be a pleasant surprise if it gets production in the Ellenburger.

The southwest offset to the discovery is reported to have run about 34 ft. low on the Ellenburger. It has drilled about 950 ft. of Ellenburger, and found nothing in the bottom 465 ft. The upper part has not yet been tested.

The only well to get oil in the Ellenburger, other than the discovery, is second location northwest, about ¾ mile northwest of the discovery. This well ran 130 ft. low on the Ellenburger, according to reports, but on a recent drill-stem test, flowed at the rate of 15-25 bbl. per hour of 51° fluid with gas estimated at 10 to 15 million cubic feet per day. This was on a 1-hour test.

The northwest, northeast, and southeast offsets should soon be reaching pay depths. However, as of the present, it doesn't seem that they will throw too much light on the problem, unless they are poor wells. In that case, Benedum will be a costly exploration venture for a lot of people.

Even with hindsight, the big step-outs still look like a reasonable gamble. There are all kinds of evidence that a regional high runs through this part of the Midland basin. The Benedum discovery well was obviously on a local high on the regional. The Ellenburger was not truncated by an erosional surface as it often is in places on the Central Basin platform. There was about 1,000 ft. of pre-Pennsylvanian Paleozoic sedimentary section on top of the Ellenburger here.

The discovery well penetrated 1,002 ft. of Ellenburger section without encountering sulfur water. Therefore, it looked as though one could step away out on the structure. Even if the interpretation of the seismograph picture indicated a location was 500 ft. lower than the discovery well, this would still leave a potential 500 ft. of pay section, or even more. Nobody knew just how thick the pay section was in the discovery, because in effect it ran out of hole before encountering water.

Right now it looks as though this reasoning was erroneous. But at the time of the discovery it certainly looked reasonable. Perhaps these deep basin structures require more complex geological analysis to understand. If it is structural, and perhaps erroneous interpretation of seismic data, good offset wells will lead to further drilling in new directions. If it is a matter of local porosity development, deep basin prospects look too expensive to hunt for with present tools.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

CALIFORNIA.—In Santa Barbara County, Honolulu Oil Corp. whipstocked its No. 309-2 well out beneath the ocean to open another new tidelands field. Humble Oil & Refining Co. enters California's operations, and will drill its first well in the state in Los Angeles County.

CANADA.—Canadian Gulf-Pincer Creek 1, LSD 15, 24-3-29w4, southern Alberta foothills discovery, continues perforating and testing a porous zone at 12,194-12,236 ft. No formation water has been found on tests to date. Leduc field continues its rapid expansion, as 18 more wells are placed on production there.

WEST TEXAS.—Upton County's Benedum field had a second producer showing at Slick-Urschel Oil Co. 1 Gordon, which flowed more than 10,000,000 cu. ft. of gas and 15 bbl. of distillate with no water on first test of the Ellenburger at 11,252-11,365 ft. New correlation with discovery well places the Gordon 121 ft. low on the Ellenburger.

ROCKY MOUNTAIN AREA.—Possibility of another Tensleep discovery in the Laramie Basin was indicated by the recovery of oil on drill-stem test of that formation in the Wasatch Oil Co. 1 Hintze-Gov't., East Allen Lake wildcat just north of the Rock Creek field. The well made 1,330 ft. of 23.7°-gravity oil in 45 minutes between 3,923-65 ft., and will probably be completed at that depth. Plastic plug has been set by Bay at its first well in the Lodgepole area, Weston County, Wyoming, and the second well is now projected as a Sundance test after failing to find saturation in the Dakota. At Seeley Dome, Rio Blanco County, Colorado, G. L. Reasor has found saturation in a stray sand reportedly above the Frontier.

MID-CONTINENT.—In Oklahoma, little-developed Grant County got a new pool, when British-American 1 Corneil averaged 21 bbl. per hour for 11 hours. Atlantic Refining Co. 1 McDonald, 11-21s-13e, Stafford County, Kansas, opened a new pool near Rothgarn.

Facts you should know about GOODALL FLEXO ROTARY HOSE AND REPAIR SERVICE

It is well established that Goodall Flexo Rotary Hose — with Barney Couplings — has the longest life of any rotary hose combination ever developed. In addition, Goodall maintains a repair department in Houston that further increases the service you get from this outstanding hose.

In the event that the hose ruptures behind the coupling—the most common cause for rotary hose replacement—it can be easily repaired at low cost by simply resetting the coupling in good hose. The loss in length may be as little as 18 inches. Sometimes this inexpensive repair job may save the hose several times before it finally becomes too short.

In case of damage near the center of the hose (or if the usable hose is too short) why not have the couplings reset in short lengths for use as vibrator hose at a considerable saving?

Then, when the hose is completely used up, the Barney Couplings still have a trade-in value. That's another important saving that makes Goodall the first-choice rotary hose.

Goodall is the only rotary hose manufacturer to offer such service. This service, combined with the advanced features of Goodall "Flexo" Rotary Hose and Barney Couplings make Goodall the favorite with oil companies and drilling contractors everywhere.

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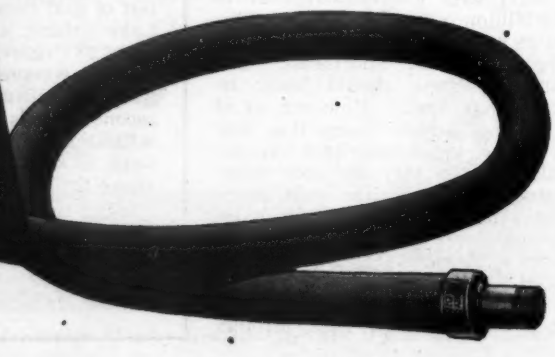


CALIFORNIA

New Tidelands Discovery Flows 97 Bbl. on Test

LOS ANGELES.—The California tidelands yielded another new oil field late last week when the Honolulu Oil Corp. 309-2 Honolulu-Signal-Macco-State, 19-4n-28w, in the Goleta area of Santa Barbara County, came in flowing at the rate of 97 bbl. of crude daily. Gravity of the oil was reported to be 28.4° and water cut 8 per cent. Pressures and bean sizes during tests were variable. The well was drilled to a total depth of 10,054 ft. and 4-in. casing set on bottom. The well was then gun perforated throughout the interval 10,020-47 ft. and 2-in. tubing with packer hung at 9,875 ft.

Honolulu's discovery well is located on the cliffs close to the ocean at Coal Oil Point, the most easterly of two points of land that extend into the ocean along the shore line of Santa Barbara County. The well was whipstocked out beneath the tidelands from this cliff location. The discovery climaxes an exploratory program which consisted of drilling five previous dusters at a cost of approximately $1,500,000. Three of the dry holes also were whipstocked beneath the ocean while the two remaining were straight holes. Prior to the start of the exploratory campaign by Honolulu Oil, Signal Oil & Gas Co. and Macco Construction Co., joint operators of a tidelands permit offshore in Santa Barbara County, two wildcat ventures had been put down at Coal Oil Point. Both of these were drilled many years ago, and the first was reported to have encountered gas while the second is said to have yielded a small amount of crude oil.

Honolulu has announced that their discovery has not yet cleaned up propertly although it has shown some tendency to do so. Until such time as it does clean up, its commercial possibilities cannot be accurately appraised.

Humble Oil & Refining Co., which recently initiated its entry into California by a large scale leasing campaign, has filed notice of intention to drill its first venture in the state. The well will be known as the 1 Los Angeles County Honor Farms and it will be located in Section 1-4n-17w in the Newhall district. The lease now held here by Humble has been tested unsuccessfully by the Barnsdall Oil Co., but it is generally conceded that Humble stands a fair chance of finding oil.

Tejon Hills Oil Co.'s shallow discovery at Tejon Ranch in Kern County apparently is following the pattern of most shallow fields and proving to be very spotty. The third well in the area has been abandoned after encountering a badly faulted situation at a total depth of 410 ft. This brings the total for the new field to two dry holes and one producer.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Comanche Point area: Tejon Hills Oil Co. 2 Tejon Hills, 10-11n-18w, pumped 50 bbl. daily, gravity 30.0°, water cut 3.0 per cent, elev. 1,110 ft., TD 408 ft.

Los Angeles County, Aliso Canyon area: Standard of California 1-5 Frew, 29-3n-16w, flowed 830 bbl. daily through 30/64-in. choke, 300,000 cu. ft. gas, gravity 20.3°, water cut 1.8 per cent, elev. 2,395 ft., 316 ft. perf. liner landed at 8,676 ft., TD 8,678 ft.

Monterey County, San Ardo area: The Texas Co. 2-2 Rosenberg, 34-22s-10e, pumped 75 bbl. daily, mud cut 8.0 per cent, elev. 498 ft., TD 2,159 ft.

Santa Barbara County, Olivera Canyon area: Pacific Western Oil Corp. 1 Williams Holding, 18-9n-32w, pumped 450 bbl. daily, 15.0 per cent cut, elev. 663 ft., TD 5,837 ft.

Zaca area: Tide Water Associated Oil Co. 24 Davis, 33-8n-31w, pumped 490 bbl. daily, water cut 6.0 per cent, elev. 1,025 ft., TD 4,628 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Bacon Hills area: Western Gulf Oil Co. 18-34 Spencer A-U.S., 34-28s-20e, dry, elev. 1,050 ft., TD 7,138 ft.

Elkhorn Valley area: Elkhorn Oil & Development Co. 1 Norris, 28-32s-22e, dry, elev. 2,515 ft., TD 3,420 ft.

Race Track Hill area: Standard of California 26 Buck Comm., 28-29s-29e, dry, elev. 649 ft., Santa Margarita 1,600 ft., Olcese 3,412 ft., Jewett sand 4,662 ft., Pyramid Hills 4,774 ft., Ash 4,854 ft., Vedder 4,864 ft., weathered basement 5,293 ft., solid basement 5,327 ft., TD 5,391 ft.

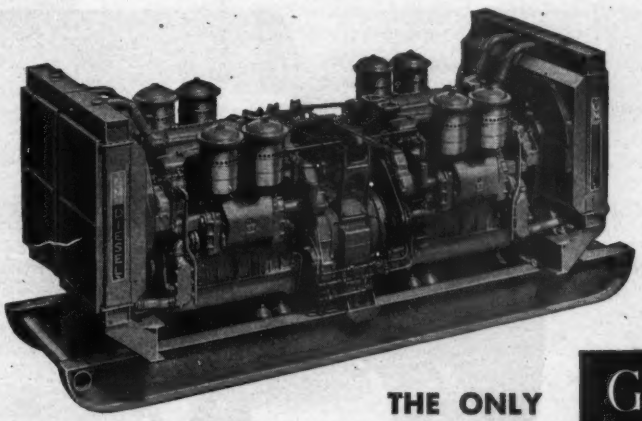
Ventura County, Fillmore area: Ernest Edwards 2 Edwards, 27-4n-19w, dry, elev. 800 ft., TD 482 ft.

MISSISSIPPI

Field Developments Show Increase

JACKSON.—Baxterville field, Lamar County, received two completions this week. Gulf Refining Co. 13 J. M. Andrews, 5-1n-16w, was completed for a potential of 354 bbl. of 16.8°-gravity oil through 7/32-in. choke. Tubing pressure was 650 psi. Total depth is 8,847 ft., with perforations at 8,754-94 ft. Gulf 3 Mrs. L. T. Simpson, in 8-1n-16w, drilled to a total depth of 8,770 ft., and was completed through perforations at 8,718-68 ft., for a potential of 362 bbl. per day through 7/32-in. choke, with tubing pressure 425 psi. Gravity was 18.1°.

California Co. 3 L. L. Smith, 22-6n-8e, in



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FLEXIBLE 600 HP DIESEL ENGINE

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"QUAD"

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This series of engines is built from a two-cylinder to a twenty-four cylinder unit, with all of the wearing parts, such as pistons, valves, and bearings interchangeable, thus simplifying the maintenance problem of drilling engines! Quads can easily be coupled-up to the conventional compound mechanism of a drawworks.

The Portability of a GM Quad makes it highly adaptable to all types of marine drilling operations.

'Round the Clock Parts and Service

George ENGINE CO., Inc.

1111 Jefferson Highway — New Orleans, La.
Lake Charles Branch — 512 Railroad Ave.

Mallalieu field, Lincoln County, was completed on pump for initial production of 189 bbl. of 38°-gravity oil per day through perforations at 10,438-69 ft. Total depth is 10,500 ft.

In Pine Ridge field, Adams County, Phillips Petroleum Co. 1 Stampley, 36-8n-2w, was completed for an initial production of 156 bbl. of oil per day flowing through a ⅛-in. choke with tubing pressure 560 psi. Gravity was 41°. Total depth is 5,650 ft., and production is through perforations at 5,568-73 ft.

Humble Oil & Refining Co. 1 Mrs. Jim G. Mozingo et al, 13-9n-8w, in Yellow Creek field, Wayne County, pumped 124 bbl. of 19.8°-gravity oil per day. Total depth is 5,153 ft. Top of perforated section is 5,095 ft. in Stanley sand.

Two wildcat locations were reported, one each in Sharkey and Yazoo counties. Six development locations were made, two in Baxterville field, and one each in La Grange, Langsdale, Mallalieu, and Yellow Creek fields.

MISSISSIPPI WILDCAT FAILURES

Adams County: Kemp Drilling Co. 1 C. E. McMillan, 64-7n-2w, dry, TD 7,007 ft.

Franklin County: Barnsdall Oil Co. 1 H. A. Wilkinson, 19-5n-4e, dry, TD 11,384 ft. Danciger Oil & Refg. Co. 1 L. A. Whittington, 12-5n-3e, dry, TD 11,154 ft.

Wayne County: C. H. Osmond 1 G. M. & O. Land Co., 29-8n-8w, dry, TD 7,800 ft.

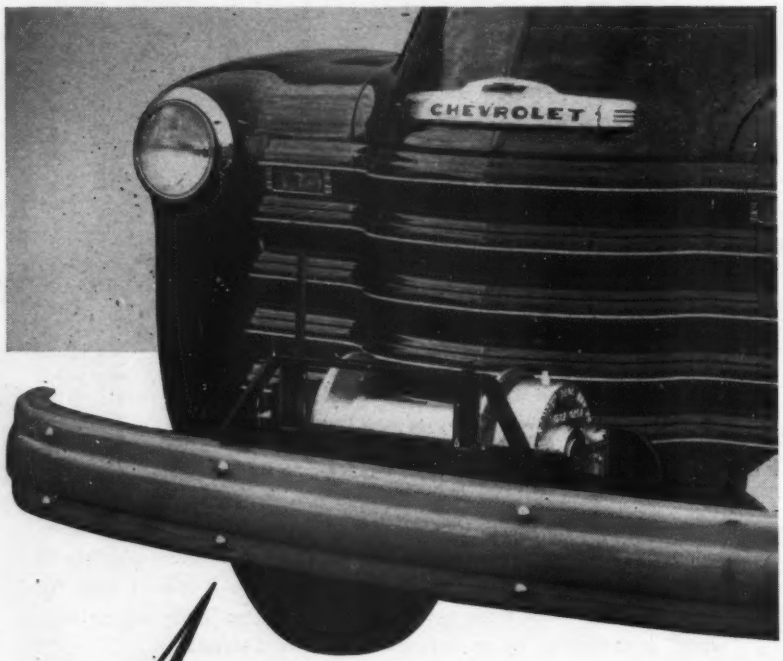
ALABAMA WILDCAT FAILURES

Baldwin County: Sohio Pet. Co. 1 Tennessee Coal, Iron & R. R. Co., C NE SW 24-4s-3e, dry, TD 8,131 ft.

Escambia County: Hunt Oil Co. 7 T. R. Miller Mills Co., C NE SW 18-2n-12e, dry, TD 6,009 ft.

FLORIDA WILDCAT FAILURE

Liberty County: R. T. Adams 1 St. Joe Paper Co., C NE SW 6-1s-6w, dry, TD 4,268 ft.



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THE RAMSEY MODEL 600 FRONT-END WINCH

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LIGHTER IN WEIGHT Winch without frame weighs only 105 pounds. Light enough for mounting on 1-ton trucks.

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SOUTH LOUISIANA

New Zone Tapped In Tepetate Field

NEW ORLEANS.—Atlantic Refining Co. B-5 C. & R. Klumpp, 13-7s-2w, has been completed as a new sand discovery in North Tepetate field, Acadia Parish. Total depth was 8,168 ft. with pay topped at 7,415 ft. Flow was 79 bbl. of 42.5°-gravity condensate daily and 5,200,000 cu. ft. of gas through 20/64-in. choke. Perforations were from 7,415-17 ft.; flowing pressure on the tubing was gaged at 2,875 psi. with no water in evidence.

Another new sand discovery was made by Roeser & Pendleton 1 Johnson-Boudreaux which was completed as a gas-condensate producer on the southeast side of the West Mermentau production in Jefferson Davis Parish. Located in 17-10s-12w, the well was drilled to 10,326 ft. with sand topped at 8,264 ft. Flow through perforations from 8,264-70 ft. was 80 bbl. daily of condensate using a 14/64-in. choke. Gas-condensate ratio was recorded at 28,00-1, and flowing pressure on the tubing was 2,450 psi. Gravity was 60° with no water in evidence.

Of interest in Gulf of Mexico operations were reports of further progress by Humble Oil & Refining Co. in its 1 State Lease 801 off Grand Isle in Jefferson Parish. In the sidetracked hole to the southwest, Humble set and cemented 9⅝-in. protection casing at 8,928 ft. and was preparing to drill the plug for further operations.

Magnolia Petroleum Co. commenced operations on its 2 Eugene Island, Block 77, located 13 miles south-southeast of Rabbit Island in St. Mary Parish. The test is being drilled from the same platform as the 1-77, which was abandoned as a shallow salt-dome discovery. Drilling in the 2-77 is below 1,380 ft. in shale. Testing continued at Magnolia's 1 Ship Shoal, Lease 766, Block 72, in the Gulf of Mexico 8 miles south of Coon Point in Terrebonne Parish. On latest report, the well flowed 1 bbl. of oil, 47 bbl. of salt water, and 113,000 cu. ft. of gas daily through 6/64-in. choke with working pressures ranging from 1,000 to 1,200 psi.

Seventeen new locations, including four wildcats, were reported last week. Three of the new locations were in Calcasieu Parish, with two each in St. Mary, Plaquemines, LaFourche, and Jefferson Davis parishes, and one each in Acadia, Cameron, Iberia, Iverville, St. Landry, and Terrebonne parishes.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Iberville Parish: New sand, St. Gabriel—Gravis & Mitchell 1 Mary Walker Goston, 7-9s-2e, TD 11,625 ft., perf. 11,015-45 ft., IP 492 bbl. condensate daily, 7/64-in. choke, GOR 3,600, TP 4,200 psi., 52° gravity, no water.

Vermilion Parish: New offshore discovery—Superior Oil Co. of California A-1 Gulf of Mexico State Lease 884, Blk. 71, 22 mi. S of Fresh Water Bayou field, 19 mi. S shore line, TD 13,628 ft., rework job drilled out to 9,680 ft., perf. 9,606-18 ft., IP 53 bbl. condensate daily with 7,024,000 cu. ft. gas through 20/64-in. choke, TP 3,800 psi., gravity 51.4°, no water.

SOUTH LOUISIANA WILDCAT FAILURES

LaFourche Parish: J. R. Frankel 1 Clotilda Plantation, Inc., 12-16s-19e, 5 mi. S Raceland field, dry, TD 11,750 ft.

St. Martin Parish: Tide Water Associated Oil Co. 1 Laurent LaPorte Estate, 38-8s-5e, 1 mi. S Arnaudville, dry, TD 11,019 ft.

Plaquemines Parish: The California Co. 1 State Lease 816, West Delta area, Blk. 24, Tract 1,196, Gulf of Mexico, 6 mi. W-SW Venice field production and 1¾ mi. offshore, dry, TD 12,611 ft.

St. Mary Parish: Magnolia Petroleum Co.

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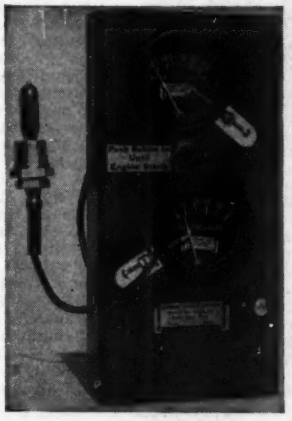

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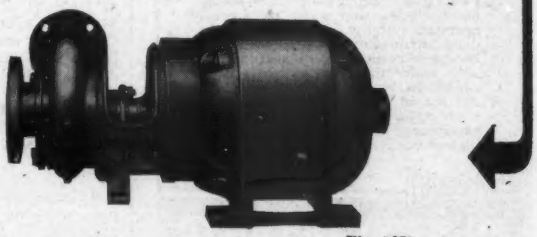

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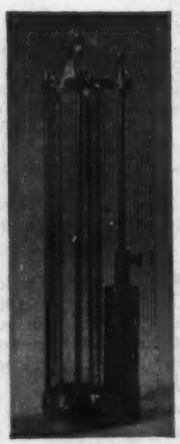

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1 State Lease 679, Eugene Island, Blk. 77, 13 mi. S-SE Rabbit Island field and 10 mi. SW Magnolia 1 State Blk. 58, dry, TD 3,715 ft.

SOUTHWEST TEXAS

Fulton Beach Field May Get New Pay

CORPUS CHRISTI.—A new deep pay zone for the Fulton Beach field of Aransas County is being tested at Placid Oil Co. 2 A. C. Glass et al, on the northeast flank of the field. Total depth is 8,254 ft., with 5-in. liner set on bottom for the completion. Perforations at 8,236-46 ft. are being tested. Drill-stem test at 8,186-92 ft. using ¼-in. chokes recovered 385 ft. of condensate. Test at 8,195-8,202 ft. recovered condensate and also tested gas-condensate at 6,962-82 ft.

Holly Development Co. and Barbara Oil Co. 2 Driscoll Estate, prospective oil discovery well in western Duval County, 2⅝ miles southeast of the Rancho Solo field, is rigging up pump unit to complete at a total depth of 2,532 ft. in oil sand topped at 2,526 ft. This well is located in Block 68, Subdivision of Santa Rosalia Grant. Operators are drilling below 500 ft. in the 3 Driscoll Estate, located 660 ft. south of the 2 discovery well.

The Texas Co. 1 Samuel D. Bloomberg et al, wildcat approximately 3,100 ft. east-northeast of the gas discovery well at Flores field in southeastern Starr County, tested gas in two sands above the Flores field discovery pay. On a 15-minute drill-stem test at 5,635-43 ft. it developed 315 psi. working pressure and bottom-hole pressure of 1,000 psi. open and 2,600 psi. closed. Drill-stem test at 5,741-47 ft. developed bottom-hole pressures of 1,150 psi. and 2,500 psi. Operators are coring ahead. This well is in Xavier Zamora Porcion 41, Abstract 77.

Jack Ammann et al A-1 Texas Power & Light Co., wildcat 10 miles southeast of Cameron and 4 miles east of Minerva in Milam County, has set 5½-in. casing to 4,030 ft. on top of the Edwards lime for a production test. Total depth is 4,035 ft. On a drill-stem test prior to setting pipe, it recovered 800 ft. of oil-cut mud from 4,010-35 ft. in 45 minutes. This well is in the Jose M. Leal Grant.

Sinclair Prairie Oil Co. 1 Grieninger, wildcat 4 miles east of the Cecil field discovery, in southwestern Hidalgo County, cored gas sand at 7,992-8,040 ft. and a sandy section with oil odor at 8,052-55 ft. This well is located in the Stratton Subdivision of Porcion 74, 8 miles north of Penitas.

The 39 new locations included 8 wildcat starts, 3 in Duval County and 1 each in Jim Wells, San Patricio, Starr, Webb and Willacy counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCAT

Jim Wells County: New oil pay, La Gloria field—Magnolia Pet. Co. 1 H. B. Barrera, Lot 5, Blk. 5, lands adj. townsite of La Gloria. Dual completion: top pay 6,118 ft. (Scott sand), TD 7,800 ft., perf. 6,120-30 ft., IP: 89 bbl. oil per day through 9/64-in. choke, GOR 842, CP 400 psi., gravity 40.4°, no water; top pay 7,562 ft. (Barrera sand), perf. 7,563-68 ft., (new sand), IP: 115 bbl. oil per day through 7/64-in. choke, GOR 1,000, TP 1,450 psi., gravity 40°, 16 per cent water.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Cameron County: The Texas Co. 1 Cameron County Water Control & Improvement District 5, Lot 4, Blk. 402, El Jardin Subd., 6½ mi. SE Brownsville, Potrero del Espiritu Santo Grant, dry, TD 14,033 ft.

Duval County: Cox & Hamon 1 G. G. Glasscock, Santa Cruz de Conception Grant, 10 mi. SE Benavides, and 3½ mi. NE Sejita field, dry, TD 6,014 ft.

Rodney DeLange 1 J. T. Dinn, J. Morales Sur. 454, South Kohler area, 24 mi. SW Freer, dry, TD 3,032 ft.

Hidalgo County: Balridge & King, Inc., et al 1 Mrs. J. A. Guerra, Santa Anita Grant, 3 mi. NW Los Indios field, 6 mi. N Linn, dry, TD 7,950 ft.

Jim Wells County: W. A. Richardson et al 1 John Duerksen Tr. 1, R. P. Haldeman Subd. of Seeligson Ranch, 3½ mi. NW Premont, dry, TD 1,050 ft.

Nueces County: Southern Minerals Corp. and Texas Gulf Prod. Co. 1 Bill Redden, Sec. 4, Wade Riverside Subd., 5 mi. NW Robstown, dry, TD 8,014 ft.

Starr County: Continental Oil Co. 1 H. R. Maresh, Sur. 503, A-372, 1½ mi. W Rincon field, dry, TD 5,800 ft.

M. P. Evans 1 Molina, Porc. 66, 6 mi. W Roma, dry, TD 1,757 ft.

Lamar Hunt Trust Est. 1 W. I. Cameron et al, Sur. 510, 16 mi. NE Rio Grande City, 2 mi. W Cameron field, dry, TD 6,005 ft.

Webb County: W. C. McBride, Inc., 1 W. V. Booth, Sur. 2292, A-3226, Palafox Tr., Joaquin Galan Grant, 17 mi. W Encinal, dry, TD 3,050 ft.

Zavala County: S. H. Howell 1 J. F. Webb, Robt. H. Kuykendall Sur. 23, 3 mi. E Batesville, dry, TD 4,251 ft.

MICHIGAN

Producers Highlight Week's Completions

SAGINAW.—Producers and dry holes were divided evenly in the past week as Michigan operators completed 8 new crude-oil wells and 4 gas producers while preparing 25 new locations. Six of the dozen dry holes were wildcats, three of those in Montcalm County.

The most prolific producer was Louis Zellman 1 Ruzinski in Dorr Township, Allegan County, reported to have flowed 60 bbl. the first 30 minutes. Another good well was Mercer Oil Co. 1 Newcombe in Bushnell Township of Montcalm County, which flowed 45 bbl. natural the first hour, then was pinched in to 80 bbl. a day. Other producers in Bay, Midland, Oceana, Ogemaw and Van Buren counties ranged from 40 to 325 bbl. a day.

New locations are scattered through a dozen counties, five in Allegan County, three each in Osceola, Mecosta and Mont-

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calm counties, two each in Arenac, Van Buren and Newaygo counties, one each in Bay, Midland, Kalkaska, Ogemaw and Genesee counties.

Michigan crude oil production averages 43,832 bbl. a day, now, according to the monthly report of Michigan Oil and Gas Association, which says the state now has 3,478 producing wells.

MICHIGAN WILDCAT FAILURES

Isabella County, Denver Township: Cities Service Oil Co. 1 George R. Keller, SE SE NE 9-15n-3w, dry in Antrim dolomite, TD 1,558 ft.

Lake County, Yates Township: Byron MacCallum 1 State, NE NE NW 22-17n-12w, dry in Detroit River, TD 3,475 ft.

Montcalm County, Douglas Township: Leonard Oil, Inc., 1 David H. Waldron, SE NE SE 22-11n-7w, dry in Dundee, TD 3,328 ft.

Pine Township: Sun Oil Co. 1 Kortes-Hansen Gas Unit, C-NE 23-11n-8w, dry, TD 1,526 ft.

Richland Township: Mercer Oil Co. 1 Lola S. Robinson et al, SE SW SE 32-12n-5w, dry in Dundee, TD 3,529 ft.

Oceana County, Elbridge Township: Carter Oil Co. 1 State-Powers, NW NW SW 8-15n-16w, dry in Detroit River, TD 2,537 ft.

TEXAS GULF COAST

Successful Tests Pace Exploratory Operations

HOUSTON.—Gulf Oil Corp. 1 W. W. Kyle, wildcat southwest of production in the North Port Neches field, Orange County, flowed gas and condensate through ⅛-in. choke on initial flow test through perforations at 8,980-90 ft. Total depth is 10,628 ft. in sidetracked hole, with 7-in. casing set at 8,666 ft. with 5-in. liner run to 9,009 ft. Tubing pressure was 4,900 psi. on the test.

Miles Production Co. 2 H. O. Blanding, wildcat approximately 1¼ miles southwest of the Cleveland field in Liberty County, flowed gas and condensate on initial test. This well is located in the James Eldridge Survey. Total depth is 5,997 ft., with 5½-in. casing cemented 1 ft. off bottom. On test of perforations at 5,924-30 ft., through 10/64-in. choke, it made 21 bbl. of condensate along with ungaged amount of gas. Flowing pressure on tubing was 2,150 psi., casing pressure 2,250 psi.

A new pay zone for Beech Creek field in Hardin County has been opened by American Republics Corp. 1 Fortenberry Fee-Section 188. On 24-hour flow test, the well gaged 155 bbl. of 41.6°-gravity oil per day through ⅛-in. choke. Flowing pressure on tubing was 1,070 psi., gas-oil ratio 619. Total depth is 7,088 ft., with 7-in. casing set on bottom. Production is through perforations at 6,728-6,730 ft.

In Madison County, Sun Oil Co. 3 G. P. Day, 2 miles west of Madisonville townsite, opened a new oil field, pumping a potential of 41.8 bbl. of 25°-gravity oil per day. Total depth is 2,466 ft. with casing cemented on bottom. This discovery is located in the John Crownover Survey.

Production string has been cemented in William Hebert Hunt Trustee, Estate 1 Welch and Silva, a wildcat test located 2 miles north of Cottonwood field in Liberty County, in the T&NO Survey. While drilling, the well tried to blow out at 8,180 ft. Hole was controlled and drilled down to a depth of 8,200 ft. and 5½-in. casing was cemented on bottom. Operators are preparing to perforate sand from 7,901 ft. to 7,926 ft. for an initial test.

Western Natural Gas Co. 1 Clayton, wildcat 10 miles west of George West and 6 miles southwest of Kittie West field, in Live Oak County, recovered 5,200 ft. of condensate-cut mud on drill-stem test from 6,971-81 ft. through ¼-in. chokes. Tool was

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open 10 minutes, and the well flowed in 9 minutes. Another test at 6,987-97 ft., using ¼-in. chokes, developed 1,200 psi. working pressure with gas-condensate flow. This well is located in Section 70, Dr. C. F. Simmons Subdivision of D. R. Fant, Jr., Survey 248, Live Oak County.

There were 43 new locations this week for Districts 2 & 3, of which 11 were wildcat starts, 2 in Jackson County, and 1 each in Brazoria, Hardin, Harris, Matagorda, Refugio, Victoria, Waller, Wharton and Wilson counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

DeWitt County: New oil discovery at Cottonwood Creek—Pan American Prod. Co. 1 Paul Lang, James Duff League, 3 mi. NW Meyersville & 2 mi. NE Holly field discovery, top pay 7,616 ft. in Massive sand, TD 7,784 ft., perf. 7,625-26 ft., IP: 35 bbl. oil per day through 7/64-in. choke, GOR 12,143, TP 1,600 psi., casing sealed, gravity 35.6°, 5½ per cent water.

Hardin County: New oil sand, Beech Creek field—American Republics Corp. 1 Fortenberry Fee-Sec. 188, W. W. Fortenberry Sur., Sec. 188, TD 7,068 ft., top sand 6,720 ft., perf. 6,728-30 ft., IP: 155 bbl. oil per day through ⅛-in. choke, GOR 619, TP 1,070 psi., 41.8° gravity, 0.8 per cent water.

Harris County: Oil discovery, Clinton East Flank—F. M. Corzelius 1 J. J. Oates, Reels & Trobough Sur. A-59, TD 7,503 ft., top sand 6,540 ft., perf. 6,541-50 ft., IP: 155 bbl. oil per day through ⅛-in. choke, GOR 836, TP 1,010 psi., CP 1,150 psi., gravity 37.5°, 0.6 per cent water.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Chambers County: Mills Bennett 1 R. J. Barrow, AB&M Sur. A-318, 9 mi. S-SE Anahuac, dry, TD 9,210 ft.

The Texas Co. 1 A. M. Wilburn NCT-2, Jergins area, John Steel Sur. A-227, dry, TD 8,245 ft.

Fort Bend County: Dick Schwab 1 Julius Gubbles et al, Samuel Kennedy Sur. A-44, Tr. 11, 1 mi. W Thompson field production, dry, TD 7,735 ft.

Liberty County: General Crude Oil Co. 4 Phoenix Dev. Co., Hull SE flank, Jesse Devore League, dry, TD 6,944 ft.

Lavaca County: Union Producing Co. B-1 Borchers, Henry Crooks Sur. A-108 20 mi. SE Yoakum, dry, TD 2,500 ft.

San Jacinto County: Butcher-Arthur, Inc., 1 Coline Oil Co., James Rankin, Jr., Sur., A-40, 5 mi. SW Cold Spring townsite, dry, TD 4,549 ft.

Harris-Funk Drlg. Co. 1 M. P. Hinchliff, H&TC Sur., A-171, 6 mi. NW Cleveland townsite, and 3 mi. of Mercy field production, dry, TD 6,850 ft.

Wharton County: Noranda Oil Co. and L. H. Pitkin 1 S. Hamburger, WCRR Sur., A-371, 8 mi. NE El Campo townsite, dry, TD 6,013 ft.

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APPALACHIAN FIELD

Bedford County Gets Important Test

PITTSBURGH. — In southwest Pennsylvania a very important wildcat location has been made in Napier Township, Bedford County, by South Penn Oil Co. et al and Eberly & Snee on the Jesse B. Miller farm. It is located on the Bedford Quadrangle approximately 1.2 miles east of the town of New Paris. The elevation is 1,666 ft. derrick floor. In Worth Township, Mercer County, United Natural Gas Co. has located a deep test on the Lowery Henderson farm, elevation 1,480 ft., on the Stoneboro Quadrangle. In Georges Township, Fayette County, Manufacturers Light & Heat Co. is drilling at 9,322 ft. in the 8 Barton Estate, and Orville Eberly is at 4,688 ft. in the 1 John Dulick. In Shade Township, Somerset County, Peoples Natural Gas Co. has encountered a fishing job in the wildcat test on the R. F. Grove farm at 8,647 ft.

There were six new locations reported in southwest Pennsylvania: One in Kittanning Township, Armstrong County, one in Porter Township, Clarion County, one in Beaver Township, Jefferson County, one each in Springhill and Washington Townships, Greene County, and one in North Strabane Township, Washington County.

No wildcat completions were reported in either southwest Pennsylvania or West Virginia, but exploratory drilling in West Virginia reported that Wm. E. Snee et al are at a depth of 8,836 ft. in the White Medina and in a very hard section, making about 1 ft. of hole in 15 runs of the tools with no show of gas as yet. In Big Creek district, McDowell County, United Fuel Gas Co., in the 1-6,219 New River & Pocahontas Coal Co., is drilling at 5,073 ft., or 1,173 ft. below the top of the Berea sand. The elevation of this well is 1,627 ft. In Wolf Creek district, Monroe County, Godfrey L. Cabot, Inc., topped the Corniferous lime at the 1-1,239 Margaret S. Twohig at 6,469 ft., with salt water at 6,524 ft. and a show of gas at 6,526 ft., surface elevation of 1,715 ft. In Steele district, Wood County, Columbian Carbon Co. 1,069 L. Thompson is drilling at 4,791 ft., topping the Corniferous lime at 4,733 ft., surface elevation 746 ft.

Good gas wells were reported in Harts Creek district, Lincoln County, by United Fuel Gas Co. 6,354 fee, which gaged 2,322,000 cu. ft. in the Salt sand, total depth 573 ft., and in Wyoming County, Oceana district, by Hope Natural Gas Co. 9,217 Loup Creek Colliery Co. with 1,050,000 cu. ft. in the Ravenscliff sand, before shot, total depth 1,885 ft.

New locations in West Virginia totaled 30: in Union district, Barbour County; Otter

district, Braxton County; Ravenswood district, Jackson County; Cabin Creek, Elk, and Poca districts, Kanawha County; Harts Creek and Laurel Hill districts, Lincoln County; Webster district, Marshall County; Cologne district, Mason County; Harvey and Stafford districts, Mingo County; Stonewall district, Wayne County; Lubeck and Williams districts, Wood County.

LA.-ARK.

New Saline Bayou Pool Gets Confirmation Well

SHREVEPORT.—H. L. Hunt 2 Louisiana Delta, 1-4n-4e, LaSalle Parish, became the second well in the new Saline Bayou field, 8 miles south of the Elm Ridge field, when it gaged 475 bbl. of 44°-gravity oil a day through 12/64-in. choke from perforations in the Wilcox at 5,560-70 ft. Gas-oil ratio was nearly three times that of the first well, at 1,450 cu. ft. The second test was also carried to the lower Cretaceous at 10,050 ft., then plugged back to 5,700 ft. for completion.

Shows of deeper production, in the Travis Peak, were reported at M. A. Halsey 1 Bishop - Lewis Unit, 30-20n-6w, projected 10,000-ft. test in the Athens field of Claiborne Parish. The well started showing gas and distillate on drill-stem tests around 7,000 ft. Drilled to 7,411 ft., still in the Travis Peak, a test from 7,174-7,230 ft., open 29 minutes, recovered 330 ft. of gas-cut mud. Tubing pressure was 1,500 psi., flowing bottom-hole pressure 2,230 psi., and shut-in pressure 3,380 psi. A 1-hour test from 7,231-68 ft. recovered 280 ft. of mud cut with gas and distillate. Pressures were 1,100 psi. on tubing, 1,430 psi. flowing and 3,206 psi. shut in. Operators were to retest between 7,347-7,411 ft. when the first test failed in 7 minutes.

Four miles east of the one-well Indian Lake field, which had gas-distillate in the Tuscaloosa, C. A. Kinard 1 Singer Manufacturing Co., 15-15n-10e, Madison Parish, resumed operations and was drilling below 5,460 ft. It is in the Tuscaloosa, topped at 5,210 ft., by samples. Murphy and Sun Oil Co. 1-B Mahoney, 5 miles east of the Delhi field in 9-17n-11e, was dry at 3,805 ft., still in the Glen Rose formation, according to early reports.

Arkansas wildcat operations reported little change over the previous week. Drilling tempo, however, has shown a steady increase since the first of the year. In Lafayette County, Stanolind Oil & Gas Co. 1 Bodcaw, 29-19s-23w, was drilling in Travis Peak at 7,597 ft., topped at 6,230 ft. by samples. Stanolind's 1 Union Saw Mill, 18-19s-24w, Smackover test in the Bradley field, was in the Glen Rose at 4,983 ft. In Little River County, K. E. Merren 1 Phelps, 6-13s-31w, is a new operation, drilling at 720 ft. Placid Oil Co. 1 Alex Smith, 32-17s-28w, Miller County, was in the Glen Rose at 4,767 ft.

Carter Oil Co. 1 Ethredge, 20-19s-16w, Union County, was drilling below 4,366 ft. in Travis Peak. Additional tops reported are the Meeken at 2,625 ft., and the Tokio at 3,067 ft. S. W. Richardson 1 Shell-Pratt, 36-19s-15w, was drilling below 4,725 ft.

NORTH LOUISIANA WILDCAT FAILURES

Concordia Parish: Sun Oil Co. 1 J. F. LaCroix, 5-7n-7e, dry, TD 9,540 ft., Wilcox 3,500 ft., Midway 6,485 ft., Arkadelphia 7,182 ft., Tuscaloosa 8,800 ft., Massive 9,383-9,400 ft., lower Cretaceous 9,400 ft., elev. 68 ft.

Madison Parish: C. H. Murphy, Jr., and Sun Oil Co. B-1 J. K. Mahoney, 9-17n-11e, dry, TD 3,805 ft., chalk 3,322 ft., gas rock 3,352 ft., upper Glen Rose 3,411 ft., upper "G" zone 3,630-38 ft., top lower "G" zone 3,792 ft., elev. 89 ft.

ARKANSAS SUCCESSFUL WILDCATS

Columbia County: Discovery of College Hill field—McAlester Fuel Co. A-1 W.

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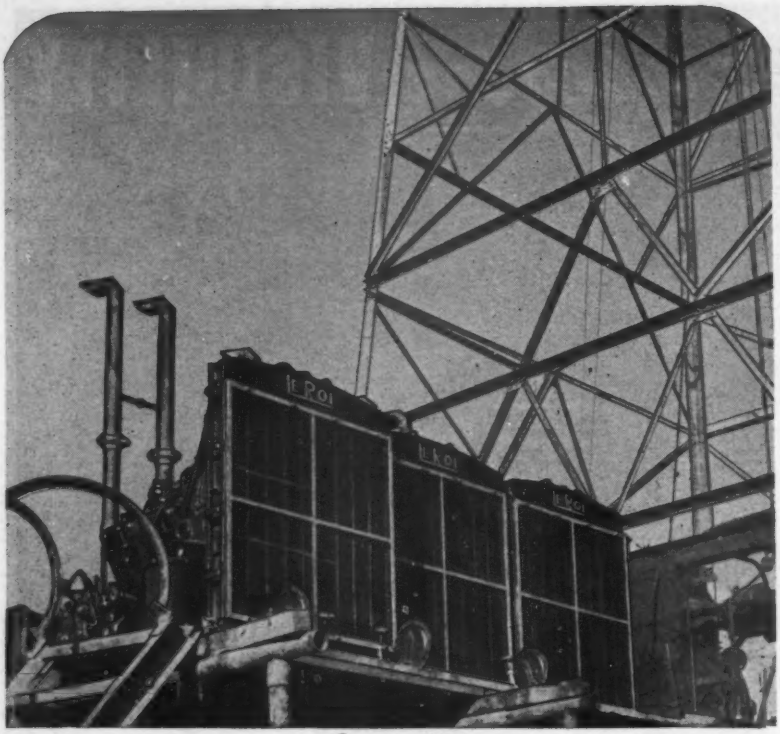

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B. Black, NW SE 24-15s-21w, pumped 66 bbl. oil and 9 bbl. water, Smackover 6,532-35 ft., TD 6,541 ft., 34.6°-grtavity oil.

Union County: Discovery of Cairo field—Phillips Petroleum Co. 1 W. B. Scales, NE SW 3-18s-17w, flowed 432 bbl. 39.3°-gravity oil a day, 15/64-in. choke, Smackover 7,769-68 ft., TD 7,878 ft., flowing tubing presure 1,020 psi., GOR 600.

ARKANSAS WILDCAT FAILURES

Columbia County: Lion Oil Co. 1 Runyan-Dodson, NE NE NE 11-16s-21w, dry, TD 2,704 ft., Midway 1,192 ft., Arkadelphia 1,508 ft., Nacatoch sand 1,636 ft., Saratoga 1,952 ft., base Annona 2,272 ft., elev. 306 ft.

Union County: Carter Oil Co. 1 Pepper, NW SE 15-19s-15w, dry, TD 8,261 ft., had salt water in Smackover at 8,187-8,203 ft., topped at 8,166 ft., elev. 251 ft.

EASTERN TEXAS

Hopkins County Gets Paluxy Production

DALLAS.—Shell Oil Co., Inc., completed its Hopkins County Paluxy sand discovery for 118 bbl. a day, on the pump, an increase in yield over earlier gages. The new well is 1 Hedrick, Yalyard Survey, 4 miles east of the Sulphur Bluff field. The oil is low gravity, from perforations at 4,500-06 and 4,525-50 ft. Talco Pipeline Co. is said to be making connections to the well.

Another Paluxy test for Hopkins County, west and south along the fault from the Sulphur Bluff field, is in the making. Location is said to be 467 ft. from north and east lines of the W. S. Page 75-acre tract in the Flanagan Hastings Survey, 1 mile southwest of the town of Birthright. Companies reported to be supporting the test include Continental Oil Co. and Magnolia Petroleum Co.

In Smith County, Humble Oil & Refining Co. 1 Kate E. Sackett, Ventura Tejeda Survey, 1½ miles south of Flint, was coring ahead below 10,380 ft. Cores from 10,340-50 ft. recovered 3 ft. of dark, nonporous limestone, having scattered stains. From 10,350-380 ft. the recovery was dense, nonporous oolitic lime, with no shows. Humble's 1 Wintters, ¾ mile southeast of Red Springs, was drilling below 8,288 ft.

Union Producing Co. 2 Bolton, 7 miles northeast of Lufkin in Angelina County, had total depth at 6,52 2ft. and was testing. A drill-stem test from 6,430-80 ft., open 26 minutes, produced a slight blow but raised no surface pressure. Recovery was 210 ft. of salt water and 90 ft. of mud with no shows. A 36-ft. core from 6,480-6,516 ft. had 20 ft. of hard lime and 16 ft. of porous lime. The interval was tested for 25 minutes, yielding 30 ft. of salty mud and 1,410 ft. of salt water. Additional salt water was recovered on a test from 6,526-86 ft.

R. J. Caraway 1 Sessions, prospective gas-distillate discovery 9 miles east of Rusk, in Cherokee County, plugged back to 4,406 ft., from 4,502 ft., and perforated the Woodbine between 4,402-02½ ft. It flowed by heads on 5/32-in. choke, making gas, a spray of salt water and a slight amount of distillate. Flowing pressures were 1,200 psi. on the tubing and 1,500 psi. on the casing.

Geier-Jackson, Inc., 1 Southern Pine, 9½ miles west of Alto in Cherokee County, is shut in to run tubing and erect separator and tanks. Last week a drill-stem test of the Woodbine at 5,313-15 ft. produced oil in 14 minutes.

Humble's deep Freestone County wildcat, the 1 McWatters, 1½ miles south of Freestone, was drilling below 16,101 ft., and apparently not yet in the Smackover.

EAST TEXAS (Districts 5 and 6)
SUCCESSFUL WILDCAT

Kaufman County: T. D. Humphrey 1 Annie Mae Tugle, E. D. Fitzgerald Sur., 5 mi. NW Mabank, 4 mi. SE Kemp, pumped 68.6 bbl. 38.8°-gravity oil a day, perforated Rodessa lime 6,258-62 ft., TD 6,996 ft., elev. 359 ft.

EAST TEXAS (Districts 5 and 6)
WILDCAT FAILURE

Shelby County: Humble Oil & Refining Co. 1 First State Bank of Tenaha, James Rowe Sur., 1 mi. NE Patroon, dry, TD 5,492 ft., Nacatoch 2,407 ft., Saratoga 2,467 ft., Austin 3,776 ft., by samples, elev. 282 ft.

PERMIAN BASIN

Benedum Distillate Offset Runs Low to Discovery

MIDLAND. — Offset distillate production to the Benedum discovery was assured this week when Slick-Urschel Oil Co. 1 A. E. Gordon, Section 47, Block Y, ¾-mile northwest of the 1 Alford, flowed distillate on a drill-stem test of the Ellenburger. Operators have placed the Ellenburger top at 11,170 ft., or minus 8,472 ft., which makes it some 121 ft. low structurally to the discovery. Earlier it was reported to be as much as 200 ft. low.

Duration of the test, from 11,252-11,365 ft., was not reported, but the water blanket started flowing in 7 minutes, gas-distillate in 10 minutes, with gas estimated at 10,000,000 to 15,000,000 cu. ft. daily, and distillate yield at 15-25 bbl. an hour. Recovery from the pipe was 500 ft. of clean, 51°-gravity distillate, and no water. Flowing bottom-hole pressure was 3,850 psi., increasing to 4,950 psi. after shut in 20 minutes. It was to be drilled to 11,500 ft. and casing set on bottom for production tests.

Slick-Urschel 1 Mary Standifer, the southwest offset, ran a 2-hour drill-stem test in the Ellenburger from 11,903-11,992 ft. Recovery was 1,080 ft. of water blanket, 320 ft. of gas-cut drilling mud and 2,475 ft. of gas-cut salt water. Deepened to 12,084 ft., a 30-minute test from 12,000-12,084 ft. recovered 60 ft. of mud. Bottom-hole pressure was 1,000 psi. It was to drill deeper. One report said there was an immediate blow of air when the tool reached bottom, which died suddenly, and until the tool was returned to the surface it could not be determined if it had opened properly.

Other tests in the Benedum area were: Plymouth Oil Co. 1 Taylor & Sadler, southeast offset, drilling below 10,784 ft. in the Silurian. Plymouth 1 Wallace, northeast offset, was drilling below 10,551 ft., in the Devonian. Reports on outlying tests included Humble Oil & Refining Co. 1-A Barnett, drilling below 12,085 ft. Humble 1-B Barnett, drilling below 8,271 ft. Republic Natural Gas Co. 1-E-A Barnett was in the Silurian at 11,236 ft. Magnolia Petroleum Co. 1-A TXL was coring black shale with streaks of sand at 8,878-89 ft. Wilshire Oil Co. 1 McElroy Ranch, was in Devonian lime at 12,789 ft.

Seaboard Oil Co. 1 E. M. Hinson, northeast Terry County discovery, started flowing at the rate of 9 bbl. of oil an hour after being swabbed for 36 hours. The oil was cut with some drilling fluid but no formation water was present, it was said. The well is producing from open hole at 9,405-55 ft., in the Cisco section of the Pennsylvanian. It has not been acidized but it was thought that operators would inject a small shot to clean out the hole. Location is 10 miles northeast of Brownfield, and a northwest offset to a 6,870-ft. dry hole drilled on the Dan Auld ranch in 1942.

Cities Service Oil Co. 1 H. S. Foster, prospective Grayburg discovery, 8 miles southwest of Odessa in Ector County, ran a drill-stem test from 4,065-4,215 ft., with the tool open 1 hour and 40 minutes. Gas came to the surface in 4 minutes, mud in 19 and oil in 25 minutes. It was allowed to flow into pits for 1 hour and 15 minutes, at an estimated rate of 5 to 10 bbl. of oil an hour. The oil is said to be 32° gravity. A second test from packer at 4,215 ft. to 4,256 ft. recovered 20 ft. of mud with no shows. Plans were to drill ahead to the San Andres before making further tests.

WEST TEXAS (Districts 8 and 7-C)
SUCCESSFUL WILDCATS

Ector County: Stanolind Oil & Gas Co. 1 E. F. Cowden "D," ¾ mi. SW Addis Deep field, Sec. 40, Blk. 43, T&P Sur., flowed 202 bbl. 39°-gravity oil a day natural, Pennsylvanian 9,205-24 ft., TD 9,235 ft., PB 9,224 ft., GOR 797, tubing pressure 150 psi., casing 600 psi., elev. 3,004 ft.

Runnels County: E. S. Price 1 Claude Brookshier, J. H. Parramore Sur. 136, 5 mi. NE Benoit, flowed 203 bbl. 37°-gravity oil a day, sand pay 3,641-3,746 ft., TD 3,750 ft., elev. 1,907 ft., casing pressure 300 psi., tubing 120 psi., GOR 1,700.

Sterling County: Plymouth Oil Co. 1 Georgia Frost, Sec. 39, Blk. 2, H&TC Sur., 1½ mi. N Iolanthe, pumped 8 bbl. 45.9°-gravity oil a day, plus 88 per cent water, Strawn 8,210 ft., top pay 8,200 ft., TD 8,444 ft., PB 8,299 ft., elev. 2,604 ft.

WEST TEXAS (Districts 8 and 7-C)
WILDCAT FAILURES

Andrews County: Stanolind Oil & Gas Co. 1 E. C. Nix "A," Sec. 21, Blk. A-47, PSL Sur., 12 mi. SW Andrews, dry, TD 11,532 ft., PB 7,480 ft., Woodford shale 9,040 ft., Devonian 9,260 ft., Ellenburger 11,522 ft., elev. 3,277 ft.

Culberson County: Cole A. Means 1 J. H. Fisher "30" Sec. 30, Blk. 111, PSL Sur.,

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20 mi. W Orla, dry, TD 2,114 ft.

Hockley County: Ray Albaugh 1 Nellie DeLoache, Labor 16, League 77, Reeves CSL, 4 mi. NW Whiteface, dry, TD 4,778 ft., San Andres 3,695 ft., elev. 3,645 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—In Chaves County, Barnsdall Oil Co. 1-A State, 23-8s-32e, was drilling below 8,382 ft. in lime and shale, thought to be the Hueco or Pennsylvanian. The formation is extremely hard and operators were to core ahead instead of drilling. Richfield Oil Corp. 2 Comanche Unit, 24-11s-26e, was rigging up pump. The flow of fluid had decreased to 22 bbl. a day, being from 60 to 70 per cent salt water. Humble Oil & Refining Co. 1-U State, 10-12s-27e, was drilling below 7,165 ft., in the Pennsylvanian, and said to be running low.

In Lea County, 3 miles southwest of Crossroads, Magnolia Petroleum Co. 1 Yates-Federal, 31-9s-36e, was delayed at 4,950 ft. by a fishing job. Cores at 4,810-4,923 ft. recovered 83 ft. of dolomite, having some pinpoint porosity and bleeding oil in spots.

South of the Hobbs field, Stanolind's 1-U State, 2-20s-38e, was drilling below 3,078 ft. Based on top of the Yates at 2,879 ft., it is running 71 ft. high to others in the area. Elevation is 3,580 ft. Contract depth is 12,000 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURE

Eddy County: Magnolia Petroleum Co. 1 Burro Hills Unit, SW SE 16-21s-22e, 27 mi. W Carlsbad, dry, TD 11,312 ft., San Andres 290 ft., Glorietta 1,485 ft., Clear Fork 2,620 ft., Pennsylvanian 5,100 ft., Mississippi 9,245 ft., Silurian 9,680 ft., Mississippi 9,245 ft., Silurian 9,680 ft., Ellenburger 10,690 ft., by samples, Mississippi 9,270 ft., Silurian 9,730 ft., Ellenburger 10,560 ft., Bliss sand 11,115 ft., pre-Cambrian 11,305 ft., by electric log.

N. CENTRAL TEXAS

Discovery Plugged Back Above Collapsed Pipe

WICHITA FALLS.—Throckmorton County's prospective Marble Falls discovery was plugged back to complete from the Caddo limestone when a nitro shot collapsed the casing in the lower formation. The well is Deep Rock Oil Corp. 1 Wright, BBB&C Survey, 3 miles southwest of Throckmorton. Casing was perforated in the Caddo from 4,350-60 ft., but a faulty cement job made it necessary to squeeze and reperforate from 4,355-60 ft. On an early test of the Caddo it made 47 bbl. of oil in 8 hours.

Four miles west of the Record field, Grisham-Hunter Corp. 1 R. A. Brown, TE&L Survey, was thought to have a prospective pay section of some 15 ft. between 3,470-90 ft. Samples, which showed fair to good porosity and good staining, were worked, then a 2-hour drill-stem test made from 3,452-95 ft. Gas came to the surface in 1 hour and 40 minutes and the recovery was 33 ft. of drilling mud, with no oil or water.

Southwest of the Odell field, in southern Throckmorton County, Woodley Petroleum Co. 1 J. E. Hughes, Block 902, TE&L Survey, logged Caddo lime from 4,115-26 ft. A 2-hour drill-stem test of that interval recovered 165 ft. of salt water. A test from 4,145-60 ft. was said to have showed gas in 30 seconds, but time of the test and recovery were not known. Other tests were run from 4,164-4,209 ft., which showed gas in 70 minutes and recovered 45 ft. of gas-cut mud, and from 4,250-75 ft., which showed gas in 35 minutes and recovered 100 ft. of gas-cut mud, plus 1,500 ft. of salt water. A 1-hour test was then run in the Mississippi, topped at 4,535 ft., drilled to 4,550 ft., which showed gas in 40 minutes and recovered 850 ft. of oil-cut mud.

Cities Service Oil Co. 1-B Manning, north offset to the discovery of the Chico conglomerate field of Wise County, was expected to add a second pay to the field when a drill-stem test recovered oil from the Caddo lime. The lime was topped at 5,085 ft., and a drill-stem test from 5,092-5,118 ft. brought gas to the surface in 5 minutes and recovered 250 ft. of oil, plus 5 ft. of mud.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Archer County: J. J. Lynn 1 Jack Neale, Sec. 2, BS&F Sur., 2 mi. NE Olney, flowed 144 bbl. 47°-gravity oil a day, Mississippian 5,198-5,208 ft., TD.

Clay County: Grace & Grace 1 Mae Fields Greer, Blk. 39, Grayson CSL, 1 mi. N Blue Grove, flowed 25 bbl. 43°-gravity oil a day, 16/64-in. choke, Caddo 5,722-52 ft., TD 6,792 ft., tubing pressure 50 psi., GOR 625.

Jones County: S. B. Roberts 1 Roy E. Prichard, G. Martinez Sur., 2½ mi. N Hawley, pumped 118 bbl. 37°-gravity oil a day, sand 2,082-95 ft., TD 2,575 ft., PB 2,103 ft.

Stephens County: Andrews & Associates 1 M. Duncan, Ruthy Campbell Sur., 4 mi. NE Ivan, flowed 14,340,000 cu. ft. gas, Caddo 4,061-71 ft., TD.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Archer County: M. G. Farmer and J. T. Myers 1 Baldwin & Lovett, BBB&CRR Sur., 8 mi. NW Olney, dry, TD 1,294 ft. in shale.

Brown County: G. C. English 1 Timmis, S. P. Williams Sur. 313, 4 mi. NE Zephyr, dry, TD 2,550 ft., Ellenburger 1,870 ft., elev. 1,300 ft.

Callahan County: Star Oil Co. 2-b Ross, Sec. 103, BBB&CRR Sur., 1 mi. NW Baird, dry, TD 1,960 ft., Swastika sand 1,895 ft.

Clay County: Josephine B. Hood 1 Harrison & Allen, J. Duncan Sur., 7 mi. N Dean, dry, TD 1,250 ft. in sandy shale.

Cooke County: R. W. Fair et al 1 D. L. Monroe, A. Dozier Sur., 3½ mi. W Gainesville, dry, TD 2,935 ft.

L. A. Hedrick 1 W. E. Lemons, J. C. Dickerson Sur., 3 mi. SE Gainesville, dry, TD 3,406 ft., Ellenburger 3,200 ft.

Eastland County: Sorrells Oil Co. 1 R. W. Kindell, Sec. 75, Blk. 4, H&TC Sur., 2 mi. NE Cisco, dry, TD 4,265 ft., Caddo 3,302 ft., Lake sand 3,531 ft., Ranger 3,729 ft., Mississippian 4,102 ft., Ellenburger 4,108 ft., elev. 1,603 ft.

Jack County: S. F. Hutcheson 2 Luther S. Wright, J. Robbins Sur., 2 mi. NW Antelope, dry, TD 801 ft.

Wilcox Oil Co. 1 J. H. Erwin, Henderson CSL, 2 mi. NE Joplin Risch field, dry, TD 5,050 ft., conglomerate 4,304 ft.

Jones County: Harry W. Elliott 2 Otto Roberts, John Gasnor Sur., ½ mi. E Nugent,

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dry, TD 1,753 ft., Sedwich lime 1,152 ft., coal 1,690-92 ft.

J. E. Gray Drilling Co. 1 Lee O. Huddleston, Sec. 27, H. Millard Sur., 5 mi. SE Hawley, dry, TD 2,515 ft.

Montague County: Los Nietos Co. 1 Minerva Paine, Wm. Donoho Sur., 4 mi. N Nocona, dry, TD 5,040 ft., Ellenburger 4,875 ft.

W. J. & John J. Moran 1 W. R. Williams "St. Jo," J. W. Kelly Sur., 4½ mi. SW St. Jo, dry, TD 7,220 ft., no tops reported.

Robertson & Ruegg 2 A. A. Hundley, I. Mabry Sur., 1 mi. NW Mallard, dry, TD 6,641 ft., conglomerate 6,558 ft.

Throckmorton County: Warren Oil Corp. 1 Hill Allen, Raymond Sanchez Sur., NW corner of county, dry, TD 5,688 ft., Canyon 2,804 ft., KMA sand 4,150 ft., Caddo 5,058 ft., Mississippian 5,389 ft., Ellenburger 5,675 ft.

Wichita County: Perkins & Cullum 1 A. P. Goetze, Sec. 2, Washington County RR Sur., 9 mi. E Electra, dry, TD 4,380 ft., conglomerate 4,275 ft., Ellenburger 4,356 ft.

KANSAS

Stafford County Well Is Pool Opener

ATLANTIC REFINING CO. 1 McDONALD, NE SW SW 11-21s-13e, Stafford County, swabbed 31 bbl. of oil per hour from the Arbuckle, topped at 3,520 ft. Total depth is 3,532 ft. with casing set on top of the Arbuckle. The well is ½ mile east of Rothgarn pool but is separated from production by a dry hole.

Delta Production Co. and B. & R. Drilling Co. 1 Hildebrand, NW NW SE 2-24s-12w, Stafford County, is undergoing tests of the Viola following poor results from the Arbuckle. An early test of the Arbuckle at 3,954-60 ft. produced ½ bbl. of oil per hour but an acid treatment brought water and the well was plugged back to 3,906 ft. Casing was then perforated opposite the Viola at 3,815-20 ft. for 2 bbl. per hour. A plug was set at 3,810 ft. and casing perforated at 3,792-3,800 ft. for 1¼ bbl. per hour plus 500,000 cu. ft. of gas. Operators were planning to treat with 5,000 gal. of acid and test again.

Alpine Oil & Royalty Co. swabbed 3 bbl. of oil per hour at 1 Douglas, CEL SE NW 23-34s-2w, Sumner County, to revive the abandoned Corbin pool. Production is from the Simpson, topped at 4,474 ft. which is 14 ft. higher than in the abandoned well. The 1 Douglas was drilled to a total depth of 4,481 ft. and operators may deepen.

El Dorado Refining Co. and Aylward Production Co. have completed 1 Meier, SE SE NW 30-15s-12w, Russell County, with a potential of 252 bbl. per day from the Arbuckle topped at 3,325 ft. Total depth is 3,331 ft.

For the week, a total of 65 new locations were reported with Barton County leading for 10 new spots. Rooks County reported eight and Butler and Rice Counties had six each.

KANSAS SUCCESSFUL WILDCAT

Barton County: Sohio et al 1 Yeakley, NW NW NW 17-18s-13w, produced 99 bbl. of oil per day from Arbuckle at 3,317-25 ft., TD.

KANSAS WILDCAT FAILURES

Barton County: Continental 1 Unruh, NW NE SW 2-20s-14w, dry, TD 3,580 ft., Lansing-Kansas City 3,230 ft., Arbuckle 3,527 ft.

Decatur County: Derby et al 1 Feely, SE SE NE 26-5s-27w, TD 4,119 ft., no tops reported.

Graham County: Anderson-Prichard 1 Dietz, SW SW SW 34-6s-23w, dry, TD 4,143 ft., Lansing-Kansas City 3,710-3,906 ft., Sooy 4,060 ft., Arbuckle 4,102 ft.

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Kaiser 1 Simpson, NE NE NE 32-7s-21w, dry, TD 3,653 ft., Sooy 3,574 ft., Arbuckle 3,612 ft.

Ness County: Jones-Shelburne & Farmer, 1 Geiss, NW NW SE 23-16s-25w, dry, TD 4,620 ft., Ft. Scott 4,452-58 ft., Mississippi lime 4,572 ft.

Pawnee County: Superior et al 1 Norris, NE NE NE 9-22s-20w, dry, TD 4,665 ft., Mississippi lime 4,316 ft., Viola 4,429 ft., Simpson 4,602 ft., Arbuckle 4,615 ft.

Rice County: Dozier 2 Hildebrand, SW NW NE 11-20s-10w, dry, TD 3,307 ft., Simpson sand 3,297 ft.

Rooks County: Gore 1 Smee, SE SE NW 35-9s-19w, dry, TD 3,775 ft., Heebner 3,373 ft., Lansing-Kansas City 3,392 ft., Arbuckle 3,752 ft.

Herndon 1 Henderson, SW NW SW 6-10s-16w, dry, TD 3,658 ft., Lansing-Kansas City 3,222-3,457 ft., Sooy 3,536 ft., Arbuckle 3,611 ft.

NEBRASKA WILDCAT FAILURE

Lincoln County: Texon 1 Fletcher, NE NE SE 2-9n-32w, dry, TD 4,405 ft., granite 4,403 ft.

OKLAHOMA

Grant County Gets Big Wilcox Strike

INTEREST in the oil possibilities of Grant County was revived this past week when the British-American Oil Producing Co. continued numerous encouraging tests at its 1 Corneil, NE NE NW 24-28n-3w, about 2 miles north of the Webb pool. Seven-inch pipe was set at 4,685 ft., top of the producing Wilcox sand, and after drilling plug, the well recovered 720 bbl. of oil in 4 hours through ½-in. choke on the initial flowing test. After subsequent successful tests the Corneil flowed an average of 21 bbl. of oil an hour for 11 hours, and tanked more than 150 bbl. in 7½ hours. The well produces from an 8-ft. interval bottomed at 4,693 ft., total depth, and is now shut in awaiting pipe-line connections.

Activity in Grant County before this strike, which may be one of the best this year in the state, has been limited. Three dry ventures surround the Corneil in Section 24, and at present there are only three small active fields in the county: Webb and Deer Creek pools, in the northeastern area, and the East Nash distillate pool discovered this year in the southwestern part of the county.

Tide Water Associated Oil Co. completed another oil well in the chain that may connect the Southeast Ceres, South Ceres, and Southwest Ceres pools in Noble County. The company's 2 Haefner, NE SW SE 4-22n-1w, offset to two good producers, flowed approximately 25 bbl. of oil per hour through ⅜-in. choke. Production is from the Burbank sand with 5½-in. casing set at 4,565 ft., and total depth is 4,632 ft.

In Garvin County, Sun Oil Co. 1 Newton, NW NE SW 23-2n-2w, extended the Northeast Elmore field approximately ½ mile to the south, when it flowed 134 bbl. of oil from the Gibson sand during the last 9 hours of a test. On a drill-stem test of the interval 6,563-6,639 ft., open 45 minutes, the well had gas in 3 minutes, oil in 39 minutes and recovered 400 ft. of oil. Total depth is 6,639 ft., with pipe set at 6,558 ft. Operators are waiting on cement.

OKLAHOMA SUCCESSFUL WILDCATS

Cleveland County: Halliburton 1 Comfort Ranch, SW SW NW 4-8n-1e, swabbed 105 bbl. of oil per day from Earlsboro at 5,780-5,843 ft., TD.

Creek County: New pay, Iron Post field—Berry 1 Anthis, SE SW SW 35-14n-8e, pumped 35 bbl. of oil per day from lower Skinner at 2,520-57 ft., TD 2,562 ft.

Hughes County: Pure 1 Derrick A, NE NE NW 32-6n-11e, gaged 2,663,000 cu. ft. of gas from Cromwell at 4,862-5,100 ft., TD 6,701 ft.

Oklahoma County: Extension, Jones field—Wood River 1 Perry, NE SE SE 30-13n-1e, pumped 25 bbl. of oil per day from conglomerate at 4,906-14 ft., TD 4,927 ft.

Extension, Jones field—Maguire 1 Ogle, NE NE SE 32-13n-1e, pumped 192 bbl. of oil per day from conglomerate at 4,858-68 ft., TD 4,890 ft.

OKLAHOMA WILDCAT FAILURES

Coal County: Simpson 1 Wood, SE SE NE 22-1n-8e, dry, TD 5,587 ft., Hunton 4,350 ft., Sylvan 4,594 ft., Viola 4,732 ft., upper McLish sand 5,216-54 ft., basal McLish sand 5,532-84 ft.

Comanche County: McKennan 1 Kluck, NW NW SW 19-1n-10w, dry, TD 2,500 ft., sandy dolomite 2,321-34 ft., lime 2,334-2,500 ft.

Cotton County: Russell 1 Homes, NW NW NW 36-2s-12w, dry, TD 2,006 ft., sand 1,54-60 ft., 1,250-54 ft., 1,262-64 ft., 1,280-84 ft., 1,314-16 ft., 1,376-84 ft., 1,392-1,402 ft., 1,406-10 ft. and 1,432-34 ft., broken sand 1,472-80 ft., sand 1,492-94 ft., 1,552-59 ft., 1,604-14 ft., 1,715-24 ft., and 1,732-36 ft., fusilinid lime 1,784 ft.

Anderson 1 Horschler, NE NE SW 20-3s-10w, dry, TD 1,660 ft., no tops reported.

Ross 1 Cain, NW NW NE 3-3s-11w, dry, TD 2,020 ft., sand 1,821-23 ft. with show of oil, fusilinid lime 1,827-37 ft.

Anderson 2 Miller, SW NE NE 1-5s-13w, dry, TD 1,682 ft., no tops reported.

Garfield County: British-American 1 Elliott Comm., NE NE SW 22-22n-4w, dry, TD 5,330 ft., sand 2,305-15 ft., Layton 4,207 ft., Big lime 4,690 ft., Mississippi lime 5,060 ft.

Garvin County: Cooper 1 Freeman, SE SW NW 9-4n-3e, dry, TD 2,754 ft., no tops reported.

Harper County: Toklan 1 Selman Ranch, C NW SE 10-26n-20w, dry, TD 6,101 ft., Herrington 2,559 ft., lime 4,499-4,512 ft., sand 4,525-41 ft., Oswego 5,463 ft., Bartlesville 6,014-30 ft., cherty Mississippi lime 6,039 ft.

Jefferson County: Kingery 1 Straka, NE NW NW 23-3s-9w, dry, TD 2,505 ft., sand 1,519-26 ft., 1,535-50 ft., 1,655-60 ft., 2,175-80 ft., 2,225-30 ft., 2,435-45 ft., and 2,465-70 ft.

Sun 1 Westberry, NW NW NE 17-5s-4w, dry, TD 6,506 ft., basal Pontotoc-Hoxbar 2,010 ft.

Lincoln County: Fleet 1 Teegarden, SE SE SE 24-16n-3e, dry, TD 4,823 ft., Hogshooter 2,878 ft., Checkerboard 3,124 ft., Oswego 3,750 ft., Mississippi lime 4,393 ft., Woodford 4,550 ft., Hunton-Misener 4,580 ft., Sylvan 4,595 ft., Viola 4,685 ft., first Wilcox 4,750 ft., second Wilcox 4,803 ft.

Noble County: Easton 1 Germack, NE NE SE 29-23n-1w, dry, TD 4,754 ft., Oreado 2,536 ft., Avant 3,215 ft., Layton 3,585 ft., Big lime 4,040 ft., Oswego 4,110 ft., Skinner 4,446 ft., Bartlesville 4,508 ft., Mississippi chat 4,654 ft., Mississippi lime 4,679 ft.

Okfuskee County: Hubbell 1 Gregg, SW SW SW 16-12n-7e, dry, TD 4,538 ft., Oswego 2,870 ft., Skinner 2,960 ft., Red Fork 3,237 ft., Inola 3,540 ft., Gilcrease 3,880 ft., Union Valley 3,950 ft., Caney 4,060 ft., Mayes 4,220 ft., Woodford 4,465 ft., Hunton 4,490 ft.

Nye 1 Manly, SW NW NW 20-12n-10e, dry, TD 3,164 ft., Bartlesville 2,380-2,580 ft., brown lime 2,628 ft., Gilcrease sand 2,947-51 ft., lower Gilcrease 3,026-32 ft., Union Valley-Cromwell 3,156 ft.

Wood Oil 1 Curry, NW NW SE 11-13n-8e, dry, TD 4,060 ft., Woodford 3,890 ft., Hunton 3,920 ft., Sylvan 3,925 ft., Viola 4,005 ft., Wilcox 4,054 ft.

Oklahoma County: Harper-Turner 1 Mayes, SE SE NW 10-14n-2w, dry, TD 5,851 ft., Pawhuska 2,717 ft., Avant 4,167 ft., Hogshooter 4,679 ft., Oswego 5,390 ft., Bartlesville 5,652-73 ft., basal Pennsylvanian-Woodford 5,717 ft., Hunton 5,773 ft., Sylvan 5,816 ft.

Pontotoc County: Sun 1 Morris, SW SW SW 11-3n-8e, dry, TD 4,456 ft., Haragan 3,424 ft., Chimney Hill 3,527 ft., bromide dense 3,952 ft., sand 3,990 ft., McLish sand 4,207 ft., McLish lime 4,336 ft., sand 4,381 ft.

Seminole County: Amerada 1 McAlister, SE NW SE 30-10n-7e, dry, TD 3,841 ft.

Stephens County: Burkes 1 Bull, SE SE SE 34-2s-9w, dry, TD 3,950 ft.

ROCKY MOUNTAIN

Laramie Basin Test Gets Tensleep Oil

DENVER. — Another Tensleep discovery for the Laramie basin of Wyoming appears definite following recovery of oil on drill-stem test from that formation in the Wasatch Oil Co. test at 1 Hintze-Government, C NE SE 18-22n-78w. The well is on the East Allen Lake structure, Carbon County, Wyoming, just north of Rock Creek field. Top of the Tensleep was logged at 3,915 ft. and on test at 3,920-45 ft. the well made a good blow of gas and recovered 180 ft. of oil, 3,150 ft. of oil-cut mud, and 675 ft. of oil at the base. Flowing pressure was 950 psi. and shut-in pressure 1,750 psi. On another test at 3,929-65 ft., total depth, the well made 1,330 ft. of 23.7°-gravity oil in 15 minutes through ⅜-in. choke. Bottom-hole pressure on this test was 1,800 psi. The well may be completed at that depth. This well was drilled to the Sundance by Garetson Drilling Co. of Wyoming, who turned a 40 per cent working interest in the block to Wasatch, a Phillips Petroleum Co. subsidiary. Union Pacific Railroad Co. is also reported to have an interest in the well. This field was discovered in 1919, with gas production from the Muddy sand around 1,350 ft., and since that time gas reserves have been depleted in the area. During the past year there have been a total of five Tensleep discoveries in the southcentral section of Wyoming, and subsequent discoveries have been made at Herrick Dome and Little Laramie by Superior Oil Co., and at Hatfield Dome and Medicine Bow by Ohio Oil Co. Ohio is now drilling a Tensleep test in Rock River field, south of East Allen Lake.

Plastic plug has been run by Bay on its 1 Christenson-Davis, C NW SE 9-44n-66w, Weston County, in an effort to shut off bottom-hole water. On a water-locater survey it was determined the water recovered on swab test was coming from the bottom 2 ft. of hole. The well swabbed at the rate of 60 bbl. of oil and 110 bbl. of water in 24 hours on test through casing last week. This well swabbed clean oil at the rate of 14 bbl. per hour on tests through the tubing prior to showing water. The operator's second well in the area at 1 Goodson-Smith, C NE SE 14-44n-66w, 2½ miles southeast of the first well, is now drilling below 6,800 ft., below the Lakota, and will be drilled to the Sundance. Dakota was topped at 6,552 ft., structurally higher than the first well, but failed to show saturation. These wells are of importance because of the extensive lease play that followed the recovery of oil in the first well.

G. L. Reasor of Chicago has reported oil on drill-stem test of his wildcat at 1 fee, NE NE NW 26-3n-90w, in the Seeley Dome area, Rio Blanco County. The well is now at 3,423 ft., total depth, and a stray sand was reported topped at 3,400 ft., with the oil between these depths. The well was scheduled as a 6,000-ft. Weber test, and is still believed to be above the Frontier formation. This well is east of Thornburg field and south of Hamilton Dome. The operator will continue tests and may plan to complete the well at its present depth.

WYOMING SUCCESSFUL WILDCAT

Niobrara County, Little Buck Creek: Continental 12 E.L.C.U. "B," NW NE SE 26-36n-64w, swabbed 14 bbl. of oil per hour from Converse at 5,216-54 ft., gravity 35.8°; first Leo 5,755 ft., second Leo 5,900 ft., TD 6,004 ft., elev. 4,398 ft. RB.

WYOMING WILDCAT FAILURES

Crook County, Rocky Point: Murray 1 Roberts, NE SE NW 4-56n-68w, dry, TD 3,304 ft., Niobrara 1,530 ft., Newcastle 3,216 ft.

Superior-Hunt-Phillips 1 Wexall, NW SE SW 13-56n-69w, dry, TD 4,000 ft., Newcastle 3,578 ft., Dakota 3,870 ft., water.

COLORADO SUCCESSFUL WILDCAT

Montezuma County, McElmo: Byrd-Frost, Western Natural, P. B. English 1 MacIntosh, 500,000 cu. ft. of gas per day from Shinarump at 1,515-40 ft., TD 5,965 ft., elev. 6,027 ft. DF, old well worked over.

COLORADO WILDCAT FAILURE

San Juan County, Boundary Butte: Western Natural, Byrd-Frost, P. B. English 1 English, C NE NW 22-43s-22e, 25,000,000 cu. ft. of gas per day from Hermosa at 4,610-70 ft., 7-in. casing 6,090 ft., Wingate 185 ft., Chinle 750 ft., Shinarumb 1,335 ft., Moenkopi 1,440 ft., Coconino 1,652 ft., Rico 3,625 ft., Molas 5,395 ft., Devonian 5,735 ft., Ordovician 5,890 ft., Lynch 5,985 ft., TD 6,090 ft.

UTAH WILDCAT FAILURE

San Juan County, Boulder Knoll: Southern Union 1 Colgram, NE NE NE 8-35s-25e, dry, TD 1,397 ft.

CANADIAN FIELDS

Alberta Venture Tests Distillate

CHATHAM. — In the southern Alberta foothills, testing has commenced at Canadian Gulf-Pincher Creek 1, LSD 15, 24-3-29w4. Bottoming below the second porous zone of the Madison, limestone at 12,516 ft., the 5-in. casing was perforated at 12,194-12,236 ft. at the base of more than 400 ft. of porosity. Tubing was run and water circulated to clear out the mud, later replaced with oil. It is planned to perforate opposite the remainder of the thick section of porosity. Tests may require 2 weeks before the value of the well is fully determined. Production from the upper zone, before the well was deepened to the lower lime, was estimated as high as 40,000,000 cu. ft. of wet gas, with 1,000 bbl. of distillate recovery.

Leduc.—In the Leduc field, 18 additional wells have been placed in production, with detailed figures of yields not yet reported. The completions include Central Co-Op 3, Central-Gas & Oil Products 1, Co-Op Leduc 2, Home-Leduc 4 and 8, and 13 producers for Imperial.

New potential producers include Home-Leduc 1, LSD 11, 21-50-26w4, finished last year at 5,345 ft. and lately reconditioned. It is the largest D-3 producer in the field, outside of the Atlantic 3, making 167 and 178 bbl. in the first 2 hours, increasing to 205 bbl. per hour with 100 psi. pressure on the separator. It was shut in and rig moved to Home-Leduc 2. Imperial 75, LSD 3, 21-50-26w4, finished below 5,080 ft., indicated a potential of 912 bbl. daily. Imperial 65, LSD 3, 16-50-26w4, south of the main central producing area, finished a D-3 producer at 5,387 ft. with flush of 1,740 bbl. daily. Saskatchewan Federated Co-Op 1, LSD 13, 35-50-26w4, in the extreme northeast of the producing area, finished below 5,124 ft., is being placed on production from the D-3 zone with potential between 1,600 and 2,000 bbl. daily. All will be placed on restricted production.

Alberta exploration. — Exploration work on an unprecedented scale is under way in the Canadian West, with 54 parties active in Alberta, 1 in Saskatchewan and 2 in Manitoba. The Alberta parties include 39

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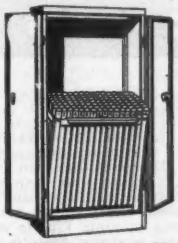
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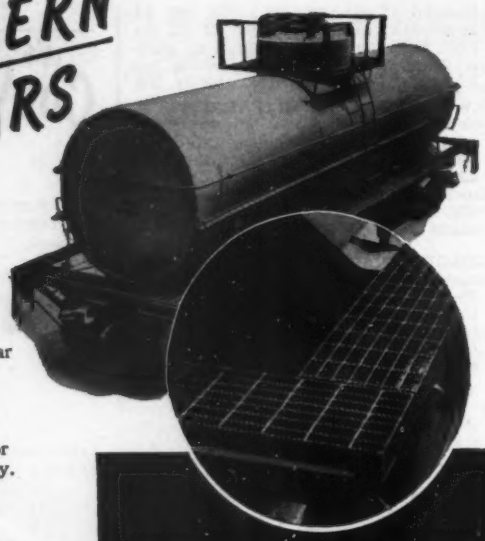

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seismographs, 9 gravity meters, 1 magnetometer and 5 core-drill and slim-hole units. Additional work is expected to start before the end of the present season.

Lloydminster.—In the Alberta section of the Lloydminster field, Imperial-H. B.-Blackfoot 5, LSD 8, 23-50-2w4, finished at 1,968 ft., has 55-bbl. initial production. Petromine 1, LSD 2, 14-50-2w4, at 1,975 ft., and Petromine 3, LSD 5, 12-50-2w5, at 1,992 ft., are on the pump with initial production unreported.

Ontario.—In the Dante area north of Bothwell, where Imperial-Dante 2 last May got initial production of 40 bbl. from No. 2 discovery well on the Hilliard Stocking farm, Dante 3, a short distance west on the Stocking farm, finished a dry hole. Dante 4, on the Jack Cracknell farm due north of the discovery, has finished a pumper with around 30 bbl. Two additional wells are drilling.

ILLINOIS

Richland County Wildcat Opens New Area

MATTOON.—Arvin Drilling Co. is testing Rosiclare lime pay at 1 LaDorca Stone, NE SE SE 18-4n-9e, about 1½ miles southeast of Passport pool in Richland County. On an early drill-stem test, the well had gas in 11 minutes and flowed clean oil in 55 minutes from pay at 3,025-32 ft. After casing was set the well was reported to be swabbing 20 bbl. per hour. Nash Redwine 1 Howard Gray, SE SE NE of the same section, has bit in or near the Rosiclare and should help evaluate the area between the 1 Stone and Passport pool.

In the area to the southeast of Clay City-Noble Consolidated in Wayne County, Indiana Farm Bureau 1 J. C. Osterman, SE NW SW 14-1s-8e, is testing McClosky lime at 3,118-22 ft. Following acid treatment, the well flowed 460 bbl. in 12 hours through tubing. Operator has two other locations staked in the same section.

Magnolia Petroleum Co. 1 Martha Drake, NE SE NW 23-4n-7e, Clay County, is cleaning out and swabbing Cypress pay at 2,590-2,601 ft., after setting casing to 2,580 ft. On a late report, the well swabbed 8 bbl. of oil in 4 hours.

Joe Reznik is running electric log at 1 Cheeley, NE NE SW 3-2n-4e, Marion County, after a 2-hour drill-stem test of the McClosky at 2,746-54 ft. recovered 292 ft. of clean oil, 315 ft. of oil-cut mud, and 855 ft. of water.

ILLINOIS WILDCAT FAILURES

White County: Indiana Farm Bureau 1 Poorman, SE SE SE 32-3s-8e, dry, TD 3,480 ft.

Calvert & Willis 1 Kirk, SE SW SE 29-4s-8e, dry, TD 3,601 ft.

Franklin County: Calvert & Willis 1 U. S. Coal & Coke Co., NE NE SE 21-5s-2e, dry, TD 2,852 ft.

Jasper County: Diamond Exploration Co. 1 E. A. Smith, NW SE SW 22-8n-14w, dry, TD 747 ft.

Bond County: Superior Oil Co. 1 Bertha L. Herrin, NW NW SE 31-5n-3w, dry, TD 968 ft.

Madison County: George Cossens 1 W. Bode, SE SW NE 19-4n-7w, dry, TD 1,685 ft.

Richland County: P. Fulk 1 J. M. Gallagher, SE SE SE 36-3n-10e, dry, TD 3,378 ft.

Marion County: E. H. Kaufman 1 Wooley, NW NW NW 16-2n-4e, dry, TD 2,797 ft.

Oil Investment, Inc., 1 W. W. Webster, SE NE SW 31-1n-1e, dry, TD 1,830 ft.

Wayne County: Aurora Gasoline Co. 1 Hoover, NW SE SW 32-1n-5e, dry, TD 2,975 ft.

White County: Gulf Refining Co. 1 Katie Russell SE SE SW 6-6s-8e, dry, TD 3,576 ft.

OHIO, KENTUCKY

Wasson Company Finds Oil and Gas

COLUMBUS.—Wasson Co. 1 Murray Coble, Section 28, Hopewell Township, Perry County, was drilled in with 750,000 cu. ft. of gas and 15 bbl. of oil natural from the Clinton sand at 2,926-66 ft. In the first 2 hours after a 100-qt. shot, the well flowed 45 bbl., but water broke in and the casing will have to be rerun before completing. In Pleasant Township, Perry County, C. Z. Ruth 5 A. R. Bennett, Section 33, found 431,000 cu. ft. of gas in the Clinton at 3,676-3,719 ft., and will be drilled down to the Medina.

In the Navarre pool, William Pfeiffer 1 J. H. Nofsinger, Section 6, Bethlehem Township, Stark County, gaged 742,000 cu. ft. of gas natural and 866,000 cu. ft. when shutin after shot. Gas was in the white Clinton at 4,179-4,203 ft.

Roy Proffitt found a stray sand at 780-811 ft. in his test on Walter Sines, Section 36, Letart Township, Meigs County, that made 25 bbl. of oil natural. Drilling was stopped at 814 ft. and the well will be tested.

Two additional wells have been completed in the Parma area. Ed Obermiller 1 William Folberth, Section 11, Royalton Township, Cuyahoga County, gaged 281,000 cu. ft. of gas in the red Clinton at 3,205-40 ft. In Lot 34, Parma Township, J. C. Steiner 1 M. M. Kaul gaged 452,000 cu. ft. of gas in the red Clinton at 3,037-84 ft. The shutin volume was 640,000 cu. ft. after shot.

New locations were up for the week with 37 being reported from 14 counties. Knox County led with six and was followed by Meigs with five, Perry four, and Washington, Morgan, Muskingum, and Tuscarawas with three each. Completions totaled 19 with Mt. Vernon and Ashland fields having 6 each.

WESTERN KENTUCKY

OWENSBORO.—The new pool opener in Webster County, F. T. Shelton et al 1 Mattie Ramsey, SE NE SW 21-M-22, has been completed with an initial production of 26 bbl. of oil and 2 bbl. of water per day from O'Hara lime at 3,040-47 ft. after treatment with 2,000 gal. of acid. It is believed locally that the small initial production may be due to a sealoff of part of the pay when casing was set, since the recovery of 1,740 ft. of oil on drillstem test would indicate much better production. Delta Drilling Co. has bit below 1,315 ft. at 1 Haleman, NE SW SW 21-M-22, and this should furnish further information on the O'Hara pay in the area north of the Ramsey well.

Sun Oil Co. has completed two additional wells in Morganfield pool, 23-O-19, Union County. Sun 4 W. A. Anderson was completed in the Waltersburg at 1,770-1,800 ft. with an initial production of 40 bbl. per day. Sun 7 Lilly Binford also made 40 bbl. per day from the Waltersburg with pay zone called at 1,776-1,800 ft.

WESTERN KENTUCKY SUCCESSFUL WILDCAT

Webster County: F. T. Shelton and Ashland Oil & Refining Co. 1 Mattie Ramsey, SE NE SW 21-M-22, IP 26 bbl., O'Hara limestone, 3,040-47 ft., TD 3,053 ft. Discovery well for Dixon pool.

EASTERN KENTUCKY

ASHLAND.—According to an unconfirmed report the Arch Carpenter 1 Wasson, 20-P-68, Powell County, had a show of oil in the St. Peter sand at 2,518 ft. Location is about 2,000 ft. northeast of the nearest St. Peter gas well in the Furnace pool. Operators will probably commence testing this week.

Ashland Oil & Refining Co. has farmed out to Sam Allen et al for a Knox test of the tract of Thomas Richardson in 12-P-65, Morgan County. Test is located in the heart of the old Cannel City (Cornieferous) field, now abandoned. Drilling was progressing below 1,600 ft.

Long & Rice 1 Golden Day, rank wildcat test for Wolfe County, located in 16-O-71, is drilling at 2,700 ft. with Knox dolomite as the objective. This is a tight hole and all pertinent data is being withheld until completion.

INDIANA

EVANSVILLE.—Sullivan County has an important wildcat at F. B. Cline 1 H. A. Seipman, SW NE SW 30-9n-8w, a test of Devonian limestone. The well flowed 420 bbl. of oil in 4 hours from Devonian pay at 2,032-39 ft. following treatment with 600 gal. of acid. The Devonian was topped at 1,955 ft. and first show of gas was reported from a test at 1,965-68 ft. Well has been shut in for tank space. Two other Devonian wells have been completed in Sullivan County in recent months. A gas well was completed in Shelburn field and an oil well was completed in Siosi pool on the northern border of the county.

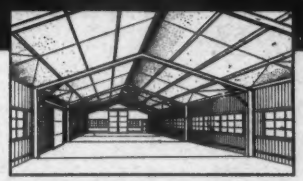
In the area west of Vanderburgh pool in Vanderburgh County, M. Rogers et al 1 Herman Ross, NW SW SW 36-5s-11w, has been completed with an initial production of 35 bbl. of oil and 30 bbl. of water from the O'Hara at 2,369-74 ft.

George & Wrather have completed 7-A Keiffer, SE SW SW 25-1s-12w, Mt. Carmel Consolidated pool, Gibson County, with an iniaiol production of 280 bbl. per day from Cypress pay at 1,985-2,010 ft. and 2,017-40 ft.

INDIANA WILDCAT FAILURES

Gibson County: Johnston Drilling Co. 1 Anton Bittner, NW NW SE 9-4s-10w, dry, TD 2,256 ft.

C. E. Skiles 1 Elizabeth Colvin, NE NE SW 27-1s-11w, dry, TD 2,237 ft.



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- BASIC UNIT WIDTHS — 40′ TO 100′ CLEAR SPAN
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- CLEARANCE AT EAVES — 12′ TO 20′

LURIA ENGINEERING CORPORATION

500 Fifth Avenue, New York 18, N. Y.

1734 Candler Bldg., Atlanta 3, Georgia — Fidelity Philadelphia Trust Bldg., Philadelphia 9, Pa. — Chamber of Commerce Bldg., Boston 10, Mass. — First National Bank Bldg., Chicago 3, Ill.

STATISTICS and

WEEKLY WELL COMPLETIONS... WEEK ENDED AUGUST 7, 1948

	Total of all wells					Cum.		Wildcat completions and discoveries					Cumulative total, 1948				
	Comp.	Oil	Gas	Dry	Footage	1948	1947	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	29	14	0	*15	34,912	932	920	0	0	0	0	0	0	0	0	0	0
Pennsylvania	48	20	5	†23	76,307	1,597	1,726	0	0	0	0	0	0	0	9	13	22
West Virginia	19	2	15	2	48,036	471	495	0	0	0	0	0	3	0	32	35	70
Ohio	19	6	6	‡7	46,436	793	781	0	0	0	0	0	2	0	9	19	30
Indiana	27	11	0	16	53,647	613	382	0	0	0	2	2	16	0	1	24	41
Kentucky	14	8	0	‡6	18,721	411	383	1	0	0	0	1	7	0	0	12	19
Illinois	62	33	0	29	157,415	1,365	1,194	0	0	0	11	11	29	0	1	203	233
Michigan	24	8	4	12	40,780	473	492	0	0	0	6	6	13	0	8	156	177
Kansas	62	28	11	‡23	200,103	1,818	1,532	1	0	0	9	10	35	0	4	251	290
Neb., Mo., Iowa	1	0	0	1	4,405	3	3	0	0	0	1	1	0	0	0	2	2
Oklahoma	102	55	8	39	325,153	2,420	2,462	4	0	1	20	25	78	7	18	392	495
Texas	271	176	10	85	1,172,317	6,949	5,370	11	0	1	41	53	201	18	61	1,213	1,493
N. Central (Dist. 7-B & 9)	89	42	3	44	260,837	2,163	1,744	3	0	1	16	20	71	0	10	433	514
West (Dist. 7-C & 8)	73	64	0	9	355,896	1,896	1,278	3	0	0	4	7	43	0	2	135	180
Panhandle (Dist. 10)	17	13	4	0	54,004	373	259	0	0	0	0	0	0	0	2	6	8
Eastern (Dist. 5 & 6)	15	10	2	3	83,193	327	302	1	0	0	1	2	7	2	0	69	78
Gulf Coast (Dist. 2 & 3)	40	27	1	12	222,745	1,097	943	3	0	0	9	12	50	14	16	268	348
Southwest (Dist. 1 & 4)	37	20	0	17	195,642	1,093	844	1	0	0	11	12	30	2	31	302	365
Louisiana	47	31	2	14	267,045	1,335	818	0	2	0	6	8	28	17	3	125	173
Northern	27	22	2	3	86,247	885	457	0	0	0	2	2	2	1	0	62	65
Southern	20	9	0	11	180,798	450	361	0	2	0	4	6	26	16	3	63	108
Arkansas	6	4	0	2	37,684	171	158	2	0	0	2	4	5	0	0	52	57
Mississippi	11	6	0	5	87,983	239	291	0	0	0	4	4	2	1	3	50	56
Southeastern States	3	0	0	3	18,408	31	34	0	0	0	3	3	0	0	0	29	29
Montana	9	7	1	1	25,699	160	156	0	0	0	0	0	3	0	0	11	14
Wyoming	10	5	0	5	42,572	284	133	1	0	0	2	3	18	0	1	28	47
Colorado-Utah	6	2	2	2	32,115	148	119	0	0	2	2	4	0	0	4	30	34
New Mexico	11	8	0	3	45,112	368	316	0	0	0	1	1	4	1	1	30	36
California	54	47	0	7	220,570	1,723	1,183	5	0	0	4	9	71	0	3	174	248
Total United States	835	471	64	300	2,955,420	22,304	18,948	25	2	4	114	145	515	44	158	2,849	3,566
Total previous week	807	451	68	288	2,859,224	21,469	18,167	31	1	5	103	140	490	42	154	2,735	3,421
Total Aug. 9, 1947	781	411	72	298	2,510,793	.....	.....	24	1	5	95	125	404	47	124	2,346	2,921

Service wells included: *15, †20, ‡1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.)

A.P.I. REFINERY REPORT, WEEK ENDED JULY 31

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	879	2,253	250	1,048	1,435	24,302	9,602	16,899	11,127
Appalachian:									
District 1	110	346	63	96	97	2,079	416	547	404
District 2	31	95	17	29	70	775	85	204	136
Ind., Ill., Ky.	971	3,310	367	1,001	1,213	20,534	3,730	8,542	5,353
Okla., Kans., Mo.	469	1,687	127	641	574	8,473	1,299	4,327	1,966
Inland Texas	244	1,054	95	200	369	3,334	834	743	810
Texas Gulf Coast	1,441	4,372	755	2,040	1,922	15,267	2,126	7,241	6,879
La. Gulf Coast	437	1,279	282	727	579	4,759	1,297	3,528	1,776
N. La. and Ark.	90	214	55	109	150	2,172	515	459	295
Rocky Mountain:									
New Mexico	11	37	7	10	26	78	25	27	34
Other Rocky Mtn.	155	431	29	185	225	2,260	250	1,121	901
California	880	2,568	166	737	2,420	15,083	872	13,023	36,032
July 31, 1948	5,718	17,646	2,213	6,823	9,080	99,116	21,051	56,661	65,713
July 24, 1948	5,591	17,879	2,166	6,625	8,825	100,641	20,382	54,756	64,556
August 2, 1947	5,309	16,558	2,055	6,070	8,563	86,032	17,769	46,693	52,935

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 223,137,000 bbl. as of July 31—up 1,840,000 bbl. One year ago 231,469,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.	
East Texas	$2.65
Kettleman Hills, California*	2.14
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	5.00
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

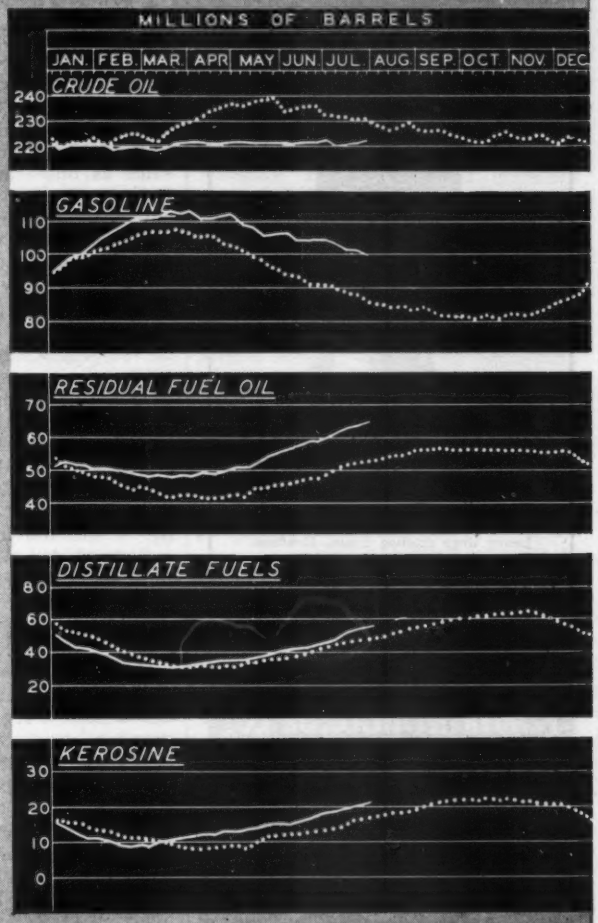
	Aug. 7 crude oil	B. of M. Aug. demand	July 31 crude oil
Alabama	1,350	1,300	1,350
Arkansas	81,875	90,000	81,200
California	950,600	955,000	953,600
Colorado	45,370	50,000	45,600
Eastern	66,900	66,200	64,100
Florida	850	800	875
Illinois	179,300	170,000	170,800
Indiana	23,900	16,000	20,800
Kansas	290,800	306,000	300,900
Kentucky	25,300	25,000	24,600
Louisiana	482,850	500,000	476,200
North Louisiana	113,650	.....	113,100
South Louisiana	369,200	.....	363,100
Michigan	45,450	46,000	41,200
Mississippi	125,935	130,000	126,000
Montana	24,600	27,000	26,470
Nebraska	400	700	400
New Mexico	132,960	138,000	128,920
Oklahoma	427,950	438,000	423,150
Texas	2,446,600	2,540,000	2,415,475
Dist. 1 (Southwest)	29,005	.....	29,050
Dist. 2 (Southwest)	178,900	.....	178,400
Dist. 4 (Southwest)	250,375	.....	246,950
Dist. 3 (Gulf Coast)	493,420	.....	489,950
Dist. 5 (Eastern)	49,575	.....	48,600
Dist. 6 (Eastern)	120,000	.....	121,500
East Texas Field	304,000	.....	303,000
Dist. 7-C (West)	43,600	.....	42,725
Dist. 8 (West)	703,050	.....	684,100
Dist. 7-B (W. Central)	50,725	.....	49,300
Dist. 9 (N. Central)	137,850	.....	133,700
Dist. 10 (Panhandle)	86,100	.....	88,200
Wyoming	150,740	160,000	149,270
Total United States	*5,503,730	5,660,000	5,450,910
Change from prev. wk., up	52,820		

Total production January 1-August 7.... †1,203,864,595 bbl.
Same period last year (crude plus cond.) 1,084,405,575 bbl.

*Not incl. 71,700 bbl. condensate. †Incl. 16,343,755 bbl. condensate.

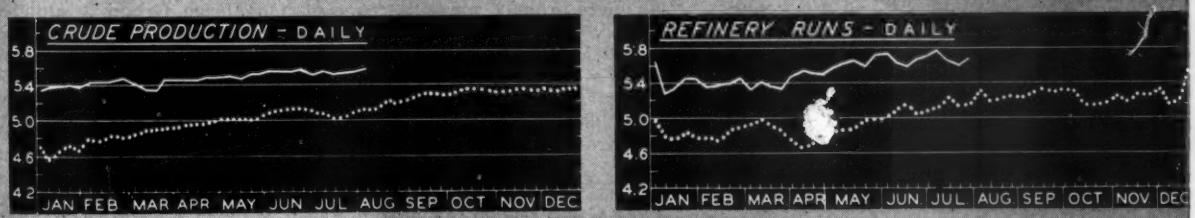
STOCKS IN UNITED STATES

---- 1947 ——— 1948



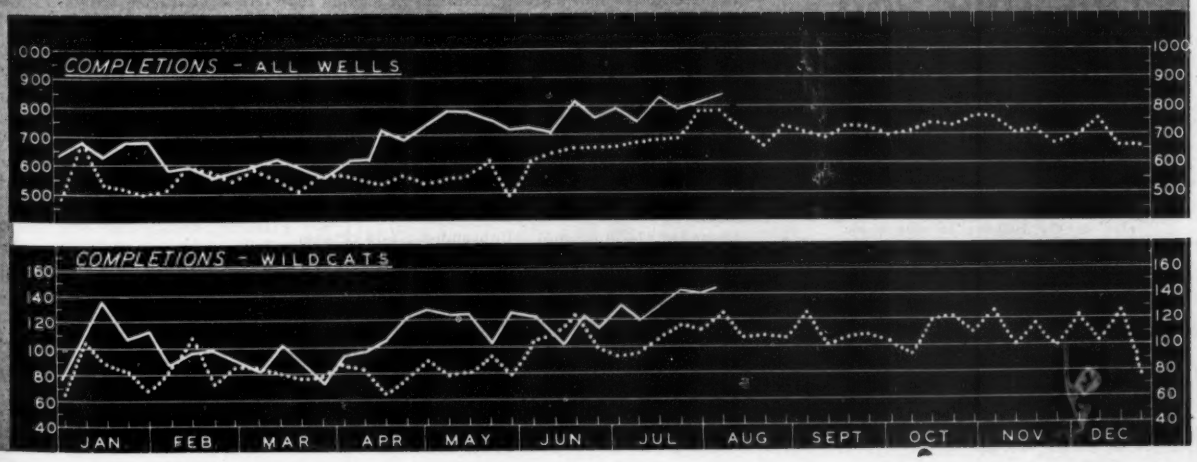
DAILY OPERATIONS

---- 1947 ——— 1948

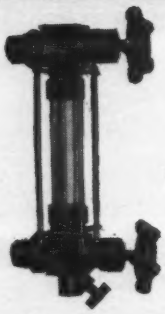


WEEKLY COMPLETIONS

---- 1947 ——— 1948



PENBERTHY
"ALL IRON"
LIQUID LEVEL GAGES



Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

The "All Iron" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

LOOK

FOR THIS CAN ON YOUR SUPPLY STORE SHELF

Use it on every threaded connection and you'll never be troubled with leaking connections. Over a million pounds used by the Industry in nine years.

Manufactured in Houston, Texas, by
RECTOR WELL EQUIPMENT CO., Inc.
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RECTORSEAL
THE POSITIVE LEAK PREVENTER

MARKETS

BUYING for the military and export appeared to be furnishing some support for an otherwise relative weak market in petroleum products on the Gulf Coast last week. Part of the effect was psychological since as one trader pointed out the Government buys on bids well in advance of shipment.

Regular-grade motor fuel for water shipment was quoted at around 13 cents. One report was that gasoline in the export trade was bringing 14½ cents with material for domestic shipment about a cent lower. Little gasoline was moving by tank car. Distillate burning oils were still going largely to storage. Storage in the East generally was said to be filled, and at 9½ cents for No. 2, little more than publication price for this material was being obtained. No. 6 was moving at between $2.80 and $2.90 for water shipment. The interior tank-car market in residual was weak.

Tone of Uneasiness

General tone of the products market was uneasiness. Many spot-market sellers were wondering if high premium prices were gone for good as a result of increased supply. No one was anticipating further price rises, barring an extremely cold winter in the East.

Another major oil company last week announced upward adjustments in its gasoline, kerosine, diesel and No. 2 oil prices at a number of points throughout New York and New England. The advances brought the company's quotations in line with Socony-Vacuum Oil Co., Inc.'s new price schedule in most cases. The increases, however, did not change the ranges in price quotations. A second large marketer last week met Socony's prices on kerosine but had taken no action on No. 2 diesel oil.

The open market trading in New York Harbor continued quiet with few offerings of gasoline or light heating oils reported available. Price quotations in petroleum products along the Atlantic Seaboard remained generally unchanged.

Price Boost for "Ethyl"

Ethyl Corp. announced early this week an increase of 7½ per cent in the price of "ethyl" antiknock compound used in automotive gasoline and approximately 7 per cent for the compound used in aviation gasoline. New price is to become effective October 16.

In the Mid-Continent area demand for motor fuel continued strong last week with most suppliers expressing the general outlook on spot-market trading as "comfortable." Price levels remained unchanged with a perceptible easing of material. Most suppliers were optimistic and were convinced that no further tightening in gasoline would be seen this season, barring of course, any unforeseen situations—particularly a heavy demand from the military.

More than two-thirds of the recent military demand for motor fuel has already been met by the industry. Suppliers in the Mid-Continent area have reported no apparent effect on the gasoline market because of the military's recent demand.

The market for No. 6 continued inactive with very few sales being reported. One large Group 3 supplier dropped his quotation for spot tank-car No. 6 from $2.50 to $2.40 per barrel, effective early this week. Shipments, however, were reported at much lower prices than $2.40 from many suppliers.

Representative Quotations

Representative spot-market quotations of leading suppliers as of August 9, 1948. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10½-11½	11.6-12* 10.5-11.9†	10.9-12½
Premium gasoline, 78-80 octane	11½-12½	10.6-13.4	12.9-13¼
42-44 w.w. kerosine	9½-10	10.3-11.9	10¼-10½
No. 2 straw fuel oil	9-9½	9.4-10.9	9.05-10
No. 6 residual	$2.30-2.50	$3.03-3.57	$2.35-2.65

*Branded (74-76 octane); †Unbranded (74-76 octane).

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9.9

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	12-14.5
750 vis No. 3-4 neutral	15-17.25
2,000 No. 5-6 neutral	17-21

LUBRICATING OILS
Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	30-33
200 vis. No. 3 neutral, 0-10 pp.	30-32

Western Pennsylvania

145-155 vis. 10 p.t. bright stock	47
180 vis. p.t. neutral	45

CRUDE-SCALE WAX
Mid-Continent

130-132 A.S.T.M. melting point	6½-6¾

EQUIPMENT MEN ... in the News

Sales Changes in Failing

Recent changes in the sales department of the George E. Failing Supply Co., Enid, Okla., include the

W. BULLER

J. BOYD

naming of Walt Buller as general sales manager and Jack Boyd as his assistant.

Buller has been with the Failing company since 1936, starting as secretary to the plant manager. During the war he was priorities manager and expediter of incoming materials and since the war he has been serving as assistant sales manager. He is 31 years of age.

Jack Boyd, who was graduated from Oklahoma A. and M. College in 1946 with a B.S. degree, began work with the Failing company in 1946 in the parts department. A year later he was transferred to the sales department. He is 26 years of age.

Bovaird Opens Duncan Store

Bovaird Supply Co., Tulsa, will formally open their new supply store at Duncan, Okla., on Thursday, August 19, according to Roscoe G. Ayers, vice president and sales manager. The opening will be attended by company executives and sales personnel, as well as factory and field representatives of many of the nation's most important oil-field equipment manufacturers.

The Duncan store gives Bovaird Supply Co. a total of 17 stores and offices in Illinois, Kansas, Oklahoma, and Texas. Bovaird has one of the longest and most colorful histories in the oil-field-supply business, having served the petroleum industry for 77 years since it was founded in 1871. The Duncan opening will be featured by refreshments and food will be served from 3 to 8 p.m.

Hinderliter Reopens Store

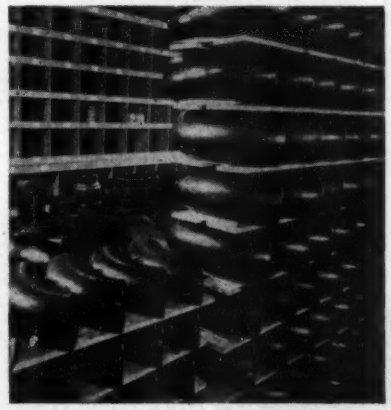
Hinderliter Tool Co. Division, H. K. Porter Co., Inc., has recently reopened its store at 2022 E. Main Street, New Iberia, La. This store, under the management of E. L. "Cotton" McGee, will provide a more convenient source of supply and service for Hinderliter customers in the southern Louisiana District.

Vinson Supply Stocks Complete Ladish Line

Vinson Supply Co., Tulsa, refinery supply concern, has been appointed distributor for the entire Ladish line of Controlled Quality welding fittings, flanges, and forged steel screwed fittings, Bailie W. Vinson, president, announced recently. Vinson formerly carried Ladish stocks, but the appointment now makes it possible for customers to be afforded the complete Ladish line.

Throughout Vinson Supply history, the firm has limited its services to handling only a very limited number of accounts. It has a complete stock of pipe, valves, flanges, and fittings. On welding fittings and flanges it maintains very large stocks in warehouses in Tulsa, Dallas, and Odessa, stocking every size and pressure range of flange, ells, tees, reducers, return bends, and caps. The Tulsa warehouse stocks over ¼ million pounds of Chase antiminal admiralty tubes, and over ½ million feet of National steel condenser tubes along with complete National boiler-tube stocks. Vinson also stocks Nordstrom plug valves and Stockham valves in large ranges and sizes in the three warehouses.

Vinson Supply is the exclusive Mid-Continent distributor for Fisher Governor Co., manufacturers of automatic pressure regulators.



Ladish welding fitting stock carried in Tulsa warehouse of Vinson Supply Co.

Blakey Named Rocky Mountain Manager

C. W. BLAKEY

Dr. A. J. Barthelmes, vice president of Seismograph Service Corp., Tulsa, has announced appointment of Carl W. Blakey as manager of the company's newly created Rocky Mountain division with offices in Denver. Blakey attended Colorado School of Mines and Oklahoma University and was employed by Seismograph Service Corp. in 1936. In 1937 he was promoted to party chief and placed in charge of a crew operating in Persia where he remained until his return to the United States in 1939. In 1945 Blakey was placed in charge of a crew operating in Iraq and a few months later was promoted to manager of the company's Middle East operations with headquarters in Cairo, Egypt, where he lived until his return to this country in March 1948.

Headquarters of Vinson Supply Co. in Tulsa

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DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

USED Le Roi 6-, 8-, and 12-cylinder gas engines, complete and in A-1 condition for oil industry power. Priced to sell. Also one Model NKU Waukesha $1500. Write or call today. General Machine & Supply Company, P. O. Box 72, Wichita Falls, Texas.

---

600 New Nordstrom 8" semisteel Valves. Tested 200 psi., weight 320 lbs. per valve. Suitable oil, gas, water. Attractive price.

SANDFORD STEEL PRODUCTS CO.
Phone Allegheny 5220
2681 Preble Ave.,
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FOR SALE
STAINLESS STEEL
Naphthenic Acid Plant

One—36" I.D. x 32' x ¼" Shell Stainless steel Fractionator with 7'-7" skirt—with 10 trays.

Four—5" x 3" x 6" Union Simplex Steam Pumps with solid stainless fluid ends.

One—Heater and Reboiler with 1" I.D. tubes and bolted return headers—stainless.

One—Condenser with ¾ I.D. tubes and bolted return headers—stainless.

Charge and product piping — stainless steel.

Analysis of stainless steel:

18% Chrome
8% Nickel
3% Molybdenum
½ to 1% Columbium

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EQUIPMENT FOR SALE

PIPE FOR SALE: Good used Lapweld oil and gas well casing sizes, 5½" OD 13#, 7" OD 17#, 7" OD 20#, and 2⅜" OD 4.7 # tubing. Reasonable price. Write or call. P.O. Box 1065, Parkersburg, W. Va. Phone 895.

FOR SALE: Wilson Master Model Winch powered by 6 MZR Waukesha engine. Unit mounted on one and one-half ton Chevrolet truck equipped with fifty foot single pole telescoping mast. Terms. Melton Supply Company, Seminole, Oklahoma.

PIPE FOR SALE: A-1 Used Lapweld Oil and Gas Well Casing, Tubing, and Line Pipe. Sizes 7" O.D. 20 lb., 7" O.D. 17 lb., 5½" O. D. 14 and 15 lb., 4" I.D. 11 lb., 3" I.D. 9 lb., 2⅜" O.D. 3.75 lb. Line Pipe. 2⅜" O.D. 4.60 lb. upset, 2⅜" O.D. 4.50 lb. regular tubing. Write: Bryson and Jaynes, P.O. Box 831, Clarksburg, West Virginia. Phone 4010.

FOR SALE: 10,000 ft. New 3½" 13.30#, Internal Upset, Range 2, API Drill Pipe, complete with tool joints. Regular price. Box C-531, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

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